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If you are using DOS 3.3, you must use a 13-sector scratch disk when saving data files. This disk must be initialized prior to use.

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PART I: INTRODUCTION

1.0 GENERAL DESCRIPTION

THE WARP FACTOR is an outer space battle game involving starships, starbases and single-pilot attack spacecraft similar to those portrayed in four different television series and at least that many motion pictures. With this program your Apple II Plus computer can simulate the battle activity of up to ten separate space vessels at a time. For maximum realism the program executes move and fire orders for all ships simultaneously, avoiding the illogical play by turns which usually characterizes space-battle games.

In a very real sense this is not a "game" at all, but a sophisticated space battle simulator and trainer. The ships and their activities have been modeled to a fine degree of detail including their internal structure and functions. Weapons crews can be given sophisticated firing commands, defensive screens can be reinforced selectively, and some ships can even make themselves invisible at times. The probability of hitting a target is a function of the power of the weapon, the range, the current effectiveness of scanners and sensors, and the speed of the target. In short, all critical factors of starship combat have been modeled in THE WARP FACTOR, and the outcome of a battle depends only on a commander's grasp of tactics in deep space!

2.0 PARTS INVENTORY

- A. Game Box
- B. Rule Book
- C. 5¼" Game Disc
- D. 3 Starship Data Cards
- E. Game Selection Card

3.0 THE BATTLESPACE, TIME, SCALE, AND DIRECTIONS

Distances in space are expressed in terms of Megaklicks (Mk), each of which represents ten million kilometers. The battle

progresses in 30-second segments (called "turns") between which commanders issue orders to their fleets. For the convenience of the player, the program expresses ship speed in terms of "Mk per turn," the number of Megaklicks the ship will travel in 30 seconds of simulated action.

The "battlespace" is an empty region of interstellar space devoid of stars, planets, asteroids, comets or nebulae. (Hyper-speed maneuvering is not safe around such navigation hazards.) Spacecraft locations are reported by the computer in standard Cartesian (X,Y) coordinates, expressed as the distance in Megaklicks from the center of the battlespace. (See Figure 1.) Battle is usually joined near the center of this empty region, near coordinate X = 0, Y = 0. Ships may progress roughly 1000 Mk in

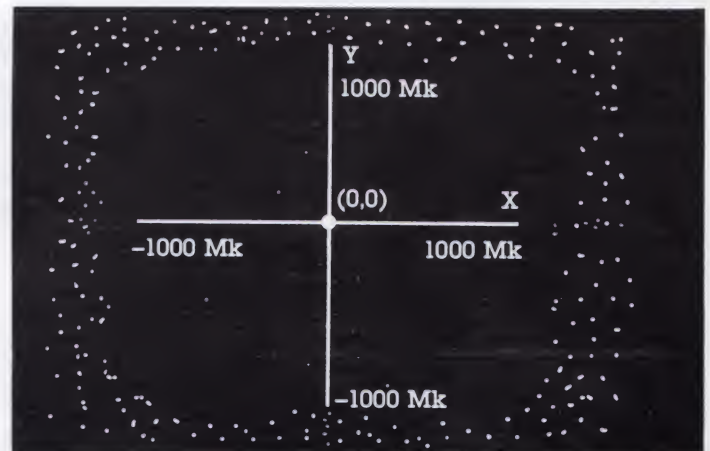


Figure 1: The battlespace is a clear region of interstellar space about 2000 Megaklicks across. Positions of ships are denoted by standard (X,Y) coordinates. Beware of interstellar debris around the edge of the battle area.

any direction from this center before being destroyed by floating space debris. This is a distance which even the fastest starships cannot cover in less than twenty turns of direct flight, so it shouldn't trouble many players.

Directions within the battlespace are given in standard 360° bearings with 0° representing galactic north (see Figure 2). Note that in all displays galactic north is pictured at the top of the screen regardless of the bearing of the ship.



Figure 2: In all displays, galactic North (0°) is always pictured at the top of the screen. All courses and bearings are defined by standard 360° notation from this reference.

4.0 THE NATIONALITIES

The program simulates the activity of ships belonging to six interstellar nationalities, the Alliance, the Klargon Empire, the Reman Marauders, Imperial Pirates, Freeman and Starbases.

4.1 THE ALLIANCE

The United Alliance of Planets is a loose association of more than a thousand inhabited planets, most of them settled by Earth colonists centuries before. The Alliance is dedicated to protecting the rights of sentient creatures throughout the galaxy, and in defense of these rights the member planets support a fleet of dreadnought and heavy cruiser starships. At the time of the outbreak of hostilities one of the cruisers had just distinguished itself by successfully returning from a five-year mission of exploration in galactic regions where no one had gone before.

4.2 THE KLARGON EMPIRE

The Klargons are a quarrelsome people who believe that their race is destined to rule the universe by virtue of their obvious superiority... a superiority which is not as obvious to others as it is to them. They venture into space in ships bristling with weapons, armed for conquest. Although a Klargon dreadnought in battle may have twice the rate of fire of most other starships, enemy commanders have learned that the Klargon's compulsive aggressiveness and low intelligence more than offset this advantage in equipment. Even so, it's a poor commander who turns his back on a Klargon.

4.3 THE REMAN MARAUDERS

The Remans are a mysterious race whose ships rarely venture into interstellar space. When they do, however, violence is the inevitable result. Springing from a world in a binary star system, the Remans have high intelligence, superior strength in hand-to-hand combat, and a venerated martial tradition, but are handicapped by a space fleet limited to sub-light velocities. Even so the Reman ships can be formidable due to their invisibility screens and their unusually powerful homing torpedoes.

At present the Remans are confined to their home solar

system by a non-aggression treaty with the Alliance. A demilitarized zone surrounds the systems, entry into which by either side constitutes an act of war. (There are rumors that the Remans have purchased the plans of a hyperspeed drive from the Klargons and are equipping a limited number of their warships with the new type of engines.)

4.4 STARBASES

Scattered throughout the galaxy are independent starbases and outposts run by members of various nationalities. Some starbases are trading posts for interstellar commerce, while others serve as military bases for starships. Due to their immense size, starbases can carry tremendous amounts of armament and are very difficult to successfully attack and destroy. Outposts (second class starbases) are less formidable. Neither starbases nor outposts can move, although they can rotate like a carousel.

4.5 IMPERIAL PIRATES

The Imperial forces are a surviving splinter group of an empire which once flourished long ago in a distant galaxy. At the present time these nefarious warriors occupy themselves by conducting raids on Alliance freighters and small star outposts. Although most interstellar combat is conducted by cruiser-class starships, the Imperials fly small three-man and one-man attack spacecraft. Individually these ships are insignificant, but in mass attacks they can do serious damage even to ships of the line.

The Imperials are especially troublesome to independent freighters and isolated star systems where starship protection is too far away for timely rescues. An interesting point about these raiders is that they strongly resemble humanoid robots. No one seems certain whether Imperial troopers are really men wearing battle armor or are actually cybernetic organisms!

4.6 FREEMEN

In response to Klargon and Imperial depredations space colonists have begun to arm their cargo ships and to build small fleets of one-man fighters for local defense. The dedicated young men and women who fly these fighters (with the help of robotic copilots) are revered as heroes on the colony worlds, where there is considerable competition for the few available spacecraft. (It helps if you have friends in high places.) Although they rarely get the opportunity, the Freeman love nothing more than to meet a flight of Imperial fighters in deep space with plenty of room for a dogfight.

5.0 THE WEAPONS: OFFENSE & DEFENSE

The space ships in THE WARP FACTOR use a variety of sophisticated weaponry both of an offensive and a defensive nature. The major characteristics of the weapons systems are given below.

5.1 PHASERS

The basic offensive weapon of most ships is a laser-like energy beam projector which fires instantaneously through hyperspace over vast distances. The energy of the beam diminishes at ranges of 40 Mk or so, but the weapons have no minimum range. In fact, some starships can be instructed to turn their phasers on themselves (to avoid capture)!

There are three kinds of phasers in general use. Light phasers are mounted as main weapons on small fighters, and as auxiliary weapons on some cruisers. Heavy phasers form the main armament of freighters, cruisers and dreadnoughts. Siege phasers are immense weapons utilized for starbase defense. Occasionally a dreadnought will be armed with a single siege phaser for starbase assault, too. In most cases phasers have limited fields of fire, dictated by ship design (you can't shoot through your own hull!). One of the challenges of the game is coordinating the position of your ship with the fields of fire of your phasers to maximize your firepower against a particular target. (See Section 6, below, for details of phaser fields of fire.)

5.2 PHOTON TORPEDOES

Starbases and Alliance starships are armed with matter-antimatter torpedoes which are projected instantaneously through hyperspace against enemy ships. Although very powerful, the range of these torpedoes is limited to about 20 Mk, they are slow to reload and they are ineffective at ranges less than 2 Mk (because they automatically arm themselves at that distance from the firing vessel). At close ranges these torpedoes can be "overcharged," which doubles their explosive power but makes them so unstable that their effective range is cut to 8 Mk at the most. Like phasers, torpedo projectors have restricted fields of fire, and usually you will have to steer your ship more or less toward the target before firing.

Photon torpedoes must be charged twice before they will fire (in two successive turns). Charging them in subsequent turns keeps them ready to fire indefinitely. Failing to charge a photon torpedo instantly reduces its accumulated charge to zero. These torpedoes may only be overcharged on the second turn of charging.

5.3 DISRUPTOR BOLTS

Klargon ships do not carry photon torpedoes but use disruptor bolts instead. Disruptors fire packets of energy quanta of the frequency best suited to break down the molecular bonds of starship hulls. Although disruptors are rapid-fire weapons with an effective range of 25 Mk or more, they do relatively little damage except at close range. Like photon torpedoes, disruptor bolts have restricted fields of fire and may be "overcharged" for more destructive effect at the cost of greatly decreasing their range. Disruptors may be fired in the same turn that they are first charged or overcharged. If a charged or overcharged disruptor is not fired it loses its charge.

5.4 PLASMA TORPEDOES

Reman ships are equipped with little offensive armament other than a plasma torpedo projector. This weapon is extremely slow and expensive to recharge, but it fires a homing torpedo which does very severe damage when it strikes an enemy ship. Most enemies of the Remans turn and try to outrun this torpedo because they know that their shields can't stand up against it. Since this is a self-guided weapon the torpedo projector's field of fire is not of concern. Targets at all bearings from the firing ship may be engaged equally well. Plasma torpedoes travel 10 Mk in their first turn and 32 Mk in their second turn.

Plasma torpedoes require three turns of charging before they can be fired. They are not stable, and must be fired in the third turn. If you fail to fire a plasma torpedo on the third charging turn, or if you fail to charge it each turn, you will lose the accumulated charge and have to start over again from zero.

5.5 DRONES

Klargon starships, Freeman vessels and some Imperials are armed with a limited number of "fire and forget" ship-to-ship missiles. These drones actively track and home in on their assigned target vessels, but they can be outrun and they have a limited fuel supply.

There are two kinds of drones. Type 1 drones fly at 15 Mk per turn, persist for two turns, and are not very powerful in detonation. They are best used against small fighters. Type 2 drones fly at 10 Mk per turn, persist for three turns, and are twice as powerful as Type 1 drones. Drones may be fired at any ship which is, or which soon will be, within range. There are no field of fire considerations.

5.6 SHIELDS

All vessels are equipped with six defensive shields each of which deflects the energy of incoming weapons within a particular 60° arc around the ship (see Figure 3). Each shield has a basic strength which depends on the design of the ship, and which can be gradually depleted by repeated enemy hits. If this basic strength is depleted to zero the shield falls and subsequent hits to that portion of the ship take effect on the hull and internal facilities.

A commander may allocate energy to general shield support, in which case every two units of energy he allocates will deflect one unit of incoming weapons energy striking on any shield. He may also elect to *reinforce* a particular shield, in which case the energy allocated is temporarily added directly to that shield's basic strength. Energy allocated to shield support and reinforcement only lasts one turn.

5.7 TRANSPORTERS AND BOARDING PARTIES

The starbases, outposts and larger ships are equipped with transporters and carry space Marine boarding parties which they can beam into an enemy ship in an attempt to sabotage or capture it. Friendly Marines can be beamed from one ship to another as reinforcements, too. Upon boarding a hostile vessel the Marines fight a bulkhead-to-bulkhead battle for key positions within the ship. Once committed they cannot be recalled, so don't send them in lightly. (You may need them within your own ship as defenders!)

Starship crew members also assist in defending their ships from boarding parties, but they don't perform as well as the Marines. Even if the assault is not successful, the internal battle itself is likely to damage the vessel and degrade its performance.

Transporters will not beam Marines through the intact shields of enemy ships. (Shields that are destroyed but strengthened by shield support will repel transporters until the shield support is destroyed.) One cannot beam aboard Imperial or Freeman ships. The beaming ship must be positioned opposite a fallen shield on the target ship before beaming can be successful. Range and bearing of the target from the beaming ship are not relevant.

5.8 SCANNERS AND SENSORS

Scanners are intelligence gathering devices which determine the enemy's location, course and speed. Sensors serve as the fire-control link between the scanners and the weapons systems. When all systems are operating at peak efficiency the scanners will locate the target, the sensors will lock the weapons on to it ... and the target will suffer greatly!

5.9 ELECTRONIC COUNTER-MEASURES (ECM)

All space craft have the ability to emit electronic "noise" in an attempt to jam or fool enemy sensors. The more energy a commander allocates to ECM the more he will degrade the enemy's automatic tracking systems. ECM is especially important when enemy drones are homing in on your ship. If you use enough ECM they may miss!

5.10 ELECTRONIC COUNTER-COUNTER-MEASURES (ECCM)

A commander may allocate energy to ECCM in an effort to overcome enemy jamming and lock sensors in spite of it. The more energy devoted to ECCM the more likely it is that automatic

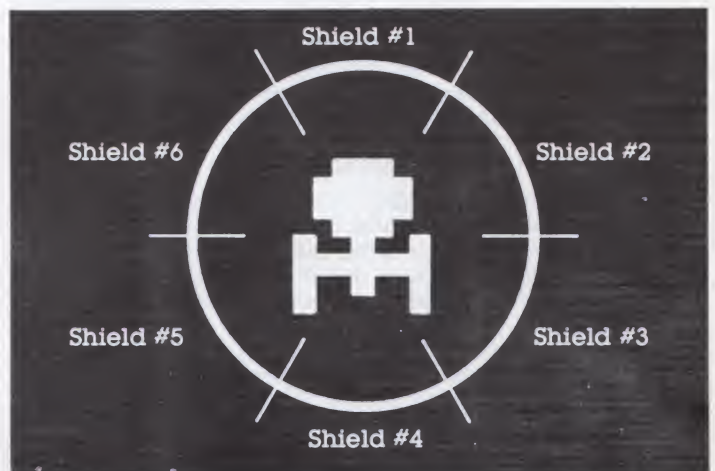


Figure 3: All ships possess six defensive shields, each of which defends one 60° arc around the ships.

tracking and firing will be successful in spite of enemy efforts to jam the scanners and sensors. ECCM will not help guided weapons (drones and plasma torpedoes) overcome ECM.

5.11 CLOAKING DEVICE

Reman ships possess a practical invisibility screen which cloaks them from detection by enemy vessels. The screen is not perfect, however, and enemy commanders can usually get a general idea of the location of the Reman vessel even though they can't accurately determine the vessel's range, course or speed. This makes attacks on cloaked Remans difficult and relatively unproductive. On the other hand, the Reman ships cannot fire their own weapons without first turning off the cloaking device.

6.0 THE SHIPS

There are twelve kinds of ships available in THE WARP FACTOR: two dreadnoughts, three cruisers, a destroyer, a starbase, an outpost, a raider, two fighters, and a freighter. As you read this section please refer to your Starship Data Sheets for a more precise description of phaser fields of fire and other technical details. Figure 4 shows the ship symbols as they appear on the computer's monitor screen.

This section also contains suggestions for appropriate ways to name the various classes of ships, included for those players who want to use authentic naming conventions.

6.1 ALLIANCE DREADNOUGHT

The Alliance heavy battleship is the ultimate instrument of Alliance diplomacy, capable of transporting emergency supplies to needy colonies, and equally capable of sterilizing planets at the touch of a button if necessary. So far, this necessity has never arisen. It carries one siege phaser and eight heavy phasers, seven of which can be fired forward, six to the side and four to the rear. It also carries four photon torpedoes which are fired forward, and fourteen Marine boarding parties. Most shields will absorb 30 units of damage without buckling, although the forward shield is slightly stronger.

Powered by three warp engines, this vessel can cover 31 Mk/turn at top speed and accelerates by 6 Mk/turn. It can change its heading by 176°/turn. Alliance dreadnoughts are usually named after political divisions of the Alliance, hence Terra Union, Alliance, Cygnus System, Martian Republic, Luna City, etc.

6.2 ALLIANCE HEAVY CRUISER

The Alliance cruiser is one of the best-known starship types in the galaxy due to the Alliance's program of exploration in search of unknown civilizations. It is armed with six heavy phasers and four photon torpedoes. All of its phasers and torpedoes will fire forward, two phasers will bear to each side, but none will shoot to the rear. It carries ten boarding parties, and has shields which will absorb 25 units of damage each.

The ship moves about 36 Mk/turn at top speed, accelerates 8 Mk/turn, and can change heading by 240°/turn. Alliance cruisers are named after valuable personal qualities, such as Ambition, Intrepid, Valiant, Steadfast, Endeavor, Endurance, etc.

6.3 KLARGON DREADNOUGHT

The Klargon dreadnought is the ship designed to forge a galaxy into a submissive empire. Its armament consists of one siege phaser, four heavy phasers, and four light phasers, plus six disruptors. The disruptors and five of the phasers will fire forward, four phasers shoot to each side, and four fire to the rear. In addition, the dreadnought carries eighteen homing drones and twenty-four Marine boarding parties. Since this vessel was designed for cracking and capturing starbases, its front shield is unusually strong (50 units), although the remaining shields are more modest in strength (30 units each).

Its three warp engines will drive it 35 Mk/turn at full speed, accelerating 6 Mk/turn, and it can change course by up to 240°/turn. Klargon ships are named in the gutteral Klargon tongue after their greatest heroes and conquests. Examples

would be Kroton, Dradnark, Grishnadrick, Marshak, and Varder.

6.4 KLARGON CRUISER

The Klargons' cruiser is a highly maneuverable harrier, designed to be used in packs against enemy starships or outposts, although it is also suitable for defense against swarms of fighters. It is armed with nine light phasers, seven firing forward, eight bearing to each side, and four firing to the rear. It has four disruptors (firing forward), six homing drones, and fourteen boarding parties. Following the Klargons' emphasis on attack, the cruisers have 30-unit shields in front (facing the enemy) but only 10-unit shields to the rear.

They can change course by 304° per turn, accelerate 8 Mk/turn, and can travel at 38 Mk/turn at top speed. These ships, too, are named after Klargon heroes.

6.5 REMAN CRUISER

First class Reman ships are light cruisers, armed with four heavy phasers (pointing forward only) and a single plasma torpedo projector. All ships of this class carry the top-secret cloaking device which makes the ships invisible to enemy scanners. Reman ships try always to face their enemies, and therefore have 40-unit shields in front and 20-unit shields to the rear.

Although limited by treaty to sublight velocities, intelligence agents have clocked Reman cruisers at speeds of 30 Mk/turn in some cases, accelerating by 8 Mk/turn. Their rate of turn is about 240° in 30 seconds. Reman cruisers are named after birds of prey, such as Falcon, Eagle, Osprey and Condor, matching their colorful warbird hull decorations.

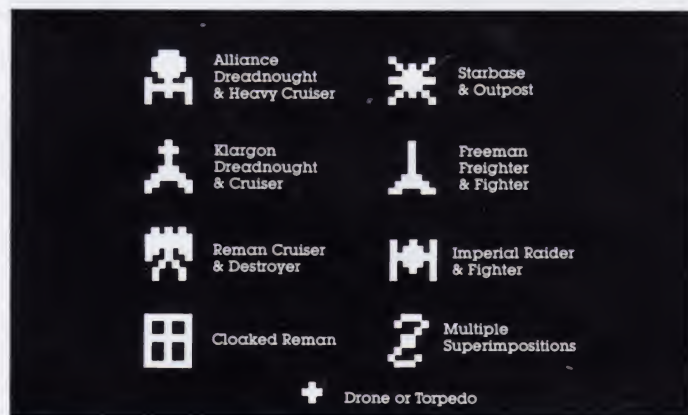


Figure 4: The twelve ships are denoted on the computer monitor by these special symbols.

6.6 REMAN DESTROYER

These little ships are a source of constant irritation to the Alliance. Never seen to travel faster than one Mk/turn (sublight), they carry no phasers at all and possess so little engine power that they ought to be very easy to defeat. This is not the case. Their ability to make themselves invisible and to launch gigantic plasma torpedoes make them hard to hit and dangerous to engage. Enemy commanders approach them with extreme caution.

Reman destroyers have a rate of turn of 368° in 30 seconds, and can reach their top speed of 1 Mk/turn almost instantly. Their names tend to emphasize the invisibility they rely on for defense ... Specter, Shimmer, Shade, and Shadow.

6.7 STARBASE

Starbases never move, but can be rotated at a rate of 64°/turn. They mount a total of nine siege phasers and six photon torpedo launchers, all of which can be rotated to bear in any direction whatsoever. Fifty Marine boarding parties are stationed in a starbase, and the energy available to reinforce the six 60-unit shields is enormous. No one attacks a starbase without a very good reason ... and several dreadnoughts. Starbases are identified by number, such as Starbase 6.

6.8 OUTPOST

An outpost is a second-class starbase which mounts six siege phasers and one photon torpedo launcher. Although the torpedo may be fired in any direction, the phasers were added later in the design and do not have unobstructed fields of fire. No more than four phasers can be brought to bear on any approaching target, and along some lines of approach only two phasers can be fired at a time. Outposts house twelve Marine boarding parties, but have such limited power that they can rarely energize all of their weapons at once and then only if they don't reinforce their 30-unit shields.

The defense of an outpost is not an easy task. Since the outpost is limited to a maximum rotation speed of 64°/turn, it is apparent that an intelligent enemy can maneuver to minimize his exposure to the outpost's phasers while attacking. Like Starbases, Outposts are identified unimaginatively by number, as in Outpost 4.

6.9 IMPERIAL RAIDER

An Imperial raider is a saucer-shaped heavy fighter which carries two forward-mounted light phasers and a disruptor bolt projector. It is piloted by a crew of three men (or are they robots after all?). It can achieve a speed of 34 Mk/turn when it needs to, accelerates 12 Mk/turn, and turns at a rate of 480° in 30 seconds. Its shields are designed to withstand a uniform 3 damage units on all sides. Unlike most spacecraft, the raiders carry a large bank of storage batteries, seemingly in place of galley and crew quarters. This has unusual effects on a raider's energy allocation budget during combat. These fighters are designated by serial numbers like K9ARF, or 31416. The robot-like crews of these vessels seem to prefer arbitrary coding to naming.

6.10 IMPERIAL FIGHTER

The Imperial fighters are one-man scout ships which fire two light phasers to the front and carry two homing drones (one Type 1 for use against other fighters and one Type 2 for attacks on outposts and larger vessels). The fighter's front and rear shields are slightly stronger than the side shields (3 units as opposed to 1 on the sides), a design feature which reflects the shoot-or-flee nature of space fighter tactics.

An Imperial fighter makes 32 Mk/turn at top speed, accelerates by 16 Mk/turn, and can turn 720° (two full circles) in 30 seconds. An Imperial fighter is usually indentified by its pilot's assigned position in the squadron's chain of command, as First Lord, Second Lord, Third Lord, etc.

6.11 FREEMEN FREIGHTER

The Freeman freighters usually carry a crew of two to five, and have an unusual asymmetrical design which looks like a cross between a saucer and a horseshoe. This is the only vessel in the galaxy which is designed to fight most effectively while running away, reflecting the prevailing combat philosophy of merchant spacemen.

A Freeman freighter carries two heavy phasers which fire to either side, although both weapons will bear directly to the rear if necessary. A very unusual design feature is the heavy shield to the rear of the vessel (10 units as opposed to 7 elsewhere). Most of these ships also mount four Type 1 drones to help discourage fighters.

A vessel such as this will travel 40 Mk/turn at top speed, accelerates by 12 Mk/turn, and can change course by 400° in 30 seconds... which is handy if you don't want to show your cargo to the port authorities. Freighters are run by colorful quasi-legal crews who tend to select wild and colorful names for their ships, like Magenta Crayon, Thunder Baby, Century Sparrow, and Old Crow.

6.12 FREEMEN FIGHTER

The one-man, one-robot Freeman fighter is almost identical to the Imperial fighter in performance, although its sleek, needle-like appearance is in contrast to the blocky design of the Imperial craft. The most significant difference between the two is the Freeman fighter's twin Type 1 drones, suited to its role as a

defender of freighters against Imperial pirates. Since Freeman do not usually conduct raids against outposts, they prefer to carry the faster Type 1 drones rather than the more powerful Type 2's.

This vessel's top speed is 32 Mk/turn, it accelerates at 16 Mk/turn, and it can make a 720° course change within 30 seconds. Its shields, like the Imperial fighter's, are stronger to the front and rear (3 units as opposed to 1 on the sides). Freeman fighters are nick-named after their pilots, such as Senator, Hans, Slim, Star, Buck, Roger, Dushess, etc. Occasionally more formal designations are required in fleet actions, and temporary names are assigned like Blue Leader, 1 Blue, 2 Blue, etc.

7.0 DAMAGE TO SHIPS

When a ship is struck by enemy weapons the damage may occur to any of a number of facilities within the ship. The program reports two kinds of battle damage. *General damage* is the amount of damage done to general ship facilities. This kind of damage may degrade energy reserves, weapon availability, or the function of key devices like sensors. It may also reflect damage to inconsequential parts of the ship such as the cargo holds.

Critical damage, however, indicates destruction of vital facilities without which the ship cannot maintain itself in space. It is possible for a ship to sustain so much general damage to its shields, sensors and weapons that it can no longer contribute to the battle, but in theory it would still be capable of returning to a starbase for repairs. Too many critical hits, however, result in the total destruction of the ship. Usually this is the goal of enemy action.

This distinction between general damage and critical damage explains the sometimes paradoxical status reports which show all phasers and torpedoes destroyed but critical damage still "insignificant." It's like a naval destroyer having its guns and depth charges shot away but its hull, engines and rudder intact. It can't fight, but it isn't sinking, either. On the other hand a destroyer might sink with all weapons intact if the hull was ruptured by a mine.

The program keeps track of damage to the six shields, the ship's armor (internal shields around critical equipment), forward and aft cargo holds, scientific and medical labs, Marine boarding parties, tractor beam equipment, probes, phasers, bridge, flag bridge, emergency bridge, auxiliary control room, security (brig), sensors, scanners, warp engines (port, starboard and midships), impulse engines, atomic power reactors, storage batteries, transporter, cloaking device, hangar deck, drone rack, torpedoes and disruptors.

Obviously, not all ships can sustain damage in all of these categories! One-man fighters, for instance, contain weapons, engines sensors and practically nothing else!

PART II: RUNNING THE PROGRAM

1.0 AUDITING YOUR RETURNS

THE WARP FACTOR will usually accept single-key or two-key commands as soon as they are typed, without the necessity of pressing the RETURN button. Some commands, however, may require an uncertain number of keystrokes. (To set course you might type one key, two keys, or three keys to indicate a bearing of 1, 10, or 100 degrees, respectively.) In such cases the program will show you a flashing white cursor to prompt you to press RETURN when you are ready.

For your convenience, the program has been structured to interpret solitary RETURNS as zeroes (Exception: see 4.3.2). In this way you can rapidly advance through the command dialogs just by pressing RETURN for options you do not wish to energize. Be warned, however, that there is no way to backtrack. Mistaken orders, even those caused by mistakenly typing RETURN at the wrong moment, will be executed!

2.0 STARTING A GAME

To play THE WARP FACTOR you start the program and then answer a brief series of questions which tell the computer what kind of game you want to play.

2.1 RUN THE PROGRAM

Insert the game disk into your disk drive and turn on your computer. THE WARP FACTOR will then automatically start itself. At this point you may begin a new game or continue a game previously saved.

2.2 SELECT NATIONALITY

In most cases the program will ask you to select the nationality you wish to play, giving you a choice of the Alliance, Klargon, Reman, Starbase, Imperial or Freemen. (You won't always have complete freedom of choice, depending on which scenario you choose.) Make your selection by typing the first two letters of the nationality.

2.3 SELECT PASSWORD

In the two-player mode the program will ask you for a secret password. When it is your turn to give orders it will demand your secret password to be sure that the other player isn't trying to sabotage your ships! Use any short word which will be easy for you to remember, then press RETURN.

2.4 SELECT AND NAME SHIPS

When you have selected a nationality the program will ask how many ships you want. Type a number in the range indicated by the program. One or two ships are sufficient for most beginners.

Then the program will ask you to tell it the class (first or second) of each ship, and to christen the ship with a unique name. You may use any name you wish (even the pilot's name) but no two ships may have names beginning with the same initial. The program will check each name as it is entered and reject any which start with an initial that has already been taken.

3.0 ROUTINE OF PLAY

In THE WARP FACTOR play occurs in "turns" representing approximately 30 seconds of action. A turn consists of a command phase in which both players issue orders to all of their ships, and an execution phase in which the computer conducts movement and firing activity of all ships simultaneously.

4.0 COMMAND PHASE

In the command phase of the turn each player has an opportunity to issue orders to his ships while the other player discreetly maintains his distance from the computer. The

computer will announce the beginning of each player's command phase by demanding that player's password. (In solitaire play no password is required.)

Each player's command phase is divided into a Recon Dialog, Allocate Energy Dialog, and Maneuver and Fire Dialog for each ship or fleet under his command.

4.1 RECON DIALOG

At the beginning of the command phase for each player the program will ask you:

Do you wish to check a ship's status (Y or N)?

At this point you are allowed to check the status of any of your ships before you decide whether you wish to give fleet orders. After you have reviewed your ships you will be asked:

Do you wish to give fleet orders?

Refer to section 4. for the details of fleet orders. Once you have selected your fleet (or decided not to issue orders to your ships as a fleet) you will be presented with the following command menu:

What are your orders (SD = Set Display, SC = Status Check, AE = Allocate Energy, IS = Identify Ship EN = End Game)?

The SD, SC and IS options provide you with the tactical status of the battle, and are explained more fully below. Do not request the AE (Allocate Energy) option until you are sure that you are ready to allocate the ship's energy. Once embarked on the Allocate Energy dialog there is no choice but to finish it and no way to make changes later. Only type EN when you wish to end the game.

4.1.1 SD (Set Display)

This command sets the "view screen" to display the tactical situation. When you type SD the program will ask:

New Origin to be centered on ship's new position (Y or N)?

In most cases the best thing to do is to press the Y key, which will center the tactical display on the current ship. If you press the N key or just hit RETURN you will be asked:

New Origin's X coordinate?

New Origin's Y coordinate?

With a little experience you will be able to set the center of the display to any part of the battle area, but at first enter 0 and 0. This centers the display on the center of the battle area. The next question is:

What power of magnification (-5 to 5)?

A magnification of -5 shows a very tiny part of the battle area, while a magnification of 5 displays an immense field of view (nearly 500 Mk across). Try a magnification of 2 or 3 at first and then experiment a little. If nothing shows up on the screen try a higher number. See Figure 5 for examples.

At the very beginning of a game the best view of the situation is obtained by typing SD, RETURN, RETURN, RETURN, 1, RETURN, to these questions. This centers the display at coordinate (0,0) and sets the maximum magnification that will still show all the ships of both sides on the screen.

4.1.2 IS (Identify Ship)

The IS command lets you display sensor information about the ships shown on the view screen. As soon as you type IS the image of each ship on the display screen is replaced by the initial of the ship's name. (If the screen is not visible when you type IS the program will put you through part of the Set Display dialog before going on to the Identify Ship dialog.) The program will then inquire:

Figure 5: SET DISPLAY DIAGRAMS
(Alliance Attack on a Starbase)



Centered on (0,0), magnification 1. Best overall view at start of battle.



Same tactical display centered on Alliance Flagship at indicated magnifications:



What ship do you wish to check?

Type the initial of the ship you are interested in, or press RETURN if finished. The program will present you with a display similar to this:

SHIP'S NAME	CLS	CRS	SPD	RNG	FSH	BEARING
TERRA UNION	1	225	10	41	1	47

(Type RETURN to check another ship.)

This display tells you the ship's name, class (1st or 2nd), its course, its speed, its range from your ship, which of your shields is facing it, and the most direct course from your position to the target ship. Press the RETURN button to check another ship.

When you are finished identifying ships press the RETURN button in reply to the program's request for the next ship initial. The view screen will then reconvert to ship images.

4.1.3 SC (Status Check)

The Status Check gives you a readout of the readiness of your ships. First it asks:

For which ship?

(Press RETURN to continue.)

Type the initial or name of the ship you want to check, followed by RETURN. The screen will fill with status notations (explained below). Press RETURN when you are ready to return to the command menu. The status table contains the following information:

Shield: The status of each of the ship's six shields. If the shield strength is zero the shield is down.

Phaser: If the phaser is operational the display tells you what type of phaser it is (siege, heavy, light). If the phaser has been damaged you'll see a line of stars (* * * *).

Torpedo: The numbers in this column tell you the charging state of each torpedo launcher. This is crucial information, since Alliance photon torpedoes must be charged for two consecutive turns before firing, and Reman plasma torpedoes require three charging turns. The numbers displayed in this readout tell you the number of charges already applied to each torpedo launcher. A star next to the charging state indicates that the torpedo is overloaded; if this column contains a line of stars (* * * *) the torpedo launcher has been destroyed.

Disruptor: The disruptor column replaces the torpedo column on some ships. A 1 indicates the disruptor is ready to fire (with a star indicating an overloaded state).

Drones: Indicates the number of remaining undamaged drones.

Sensors and Scanners: Indicates the operational efficiency of the tracking and fire control systems.

Course and Speed: The current bearing and speed of the ship.

Phaser Battery: Before phasers can be fired their batteries must first be energized. Once energized, the batteries will hold a charge indefinitely until the phasers are fired. The number here represents the number of phasers you can fire before recharging the phaser batteries. Note that siege phasers use two units of energy.

Engine Power: This is the total energy available from all operating warp engines, impulse engines, and atomic energy reactors.

Number of Batteries: Some of the ship's excess power can be stored in the ship's batteries. Ships begin play with these batteries fully charged. If you allocate more energy than is available from the engines it will be drawn from the batteries. Whenever you allocate less energy than is available from the engines the excess is automatically applied to recharging the batteries.

Transporter: This number tells you the current maximum number of boarding parties you can beam aboard an enemy vessel per turn.

Damage Level: This percentage reflects the overall impact of enemy weapons on non-critical portions of the ship (i.e., 25% indicates that ¼ of the ship's non-vital areas have been destroyed).

Critical Level: A measure of the damage which threatens the survival of the ship itself.

Friendly Marines: The number of friendly Marine boarding parties aboard the ship.

Enemy Marines: The number of enemy boarding parties aboard.

Cloaking Device Operational: On Reman ships this notation appears if the cloaking device is operational.

These data will provide you with the critical information you need prior to making your command decisions.

4.1.4 EN (End Game)

This command will end the game and allow the player(s) to determine victory levels. This command will also allow the player(s) to save a game for future play.

4.2 ALLOCATE ENERGY DIALOG

The AE command is a one-way ticket to the Allocate Energy dialog. Don't give this command unless you are really ready to allocate energy. Note that it is usually most convenient to run the Allocate Energy dialog immediately after displaying the status of the ship. That way you can look over the status report while allocating energy.

Enter the Allocate Energy dialog by typing the AE (Allocate Energy) command. The program will respond with a message similar to this:

Scanners on. Life Support on.

Power Remaining = 45

Power to Phasers (0 to 6)?

The program automatically allocates energy to the scanners and life support systems, without which the crew would be functionally blind, deaf, and short of breath. Then it displays the total of the remaining engine and battery power. Lastly, it inquires how many units of energy you want to allocate to the phaser batteries, and prompts you with the minimum and maximum possible values. Usually it is best to keep the phasers fully charged. Press the "6" key and RETURN.

NOTE: Reman ships will be asked the following before they are asked to allocate energy to phasers:

Cloaking Device on (Y or N)?

Reman ships have the option to expend one unit of energy to run the Cloaking Device. If the Cloaking Device is turned on enemy ships will be unable to determine your range, course and speed, and enemy fire directed at you will be severely reduced in effectiveness. On the other hand, you won't be able to shoot back at all. You must allocate one unit of energy to the Cloaking Device each turn or it will turn itself off automatically. That can be a disaster if you aren't expecting it! The next message is:

Power Remaining = 39

Any power to Torpedoes (Y or N)?

(Some ships ask about disruptors instead of torpedoes.) If you don't want to energize the torpedoes, press RETURN. Otherwise press the Y key and RETURN.

Normal load which torpedoes?

To charge torpedo launchers for normal firing, type the numbers of the appropriate launchers one after another and then press RETURN, such as

1234<RETURN>

where "<RETURN>" means to press the RETURN button. This command would energize torpedo launchers 1 through 4. If you don't want to load any torpedoes just press RETURN by itself.

Overload which torpedoes?

If the target is within eight Megaklicks of your ship and the torpedoes (or disruptors) need only one more charge before firing, you may "overload" them to increase their explosive effect. Type the numbers of the torpedoes you wish to overload and press RETURN.

Note that this dialog lets you *load* some torpedoes for long distance shots and also *overload* others for more powerful close-range attacks. The same torpedo may not be both loaded and overloaded in the same turn. If you don't want to overload any torpedoes just press RETURN by itself.

How much energy to Shield Support?

Type the number of energy points you wish to allocate to general shield support and press RETURN. For each two units of energy allocated the shields will deflect one unit of damage. Shield support applies equally to all shields, and is best used when you are in the middle of a complex battle and don't really know which of your shields will be attacked. Otherwise it is best to allocate zero energy (just press RETURN).

Do you wish to reinforce any shields?

Each unit of energy allocated to a particular shield will deflect one unit of damage applied to that shield only. Usually shield support is best used when you are flying in to attack the enemy and know that any damage you sustain will hit a particular shield. To reinforce a shield type the Y key and RETURN. You will see:

Energy to Shield #1?

Type the number of energy units you want to allocate to Shield #1 and press RETURN. Then you will be asked about Shield #2, etc. To allocate zero energy to a shield press RETURN by itself. If you want to exit from the shield reinforcement dialog without going through all six shields just press the X key and RETURN.

What speed do you wish to go?

Enter the speed (number of Megaklicks per turn) you want the ship to travel, then press RETURN. The amount of energy needed is a function of the ship's mass, and speed (see Energy Diagram). A ship can go as fast as its engine power will allow, but speeds in excess of 30 Mk/turn tend to be unwieldy. Note that the ships have limited acceleration capabilities, and no matter how much energy you allocate they will not exceed their rated acceleration. (The excess energy is lost.) Although acceleration is limited, deceleration is not. All ships can stop on a dime if desired.

ENERGY DIAGRAM

SPEED	MASS			
	1/2	2/3	1	4/3
0	0	0	0	0
1	0	0	1	1
2	0	0	2	3
3	0	1	3	5
4	1	1	4	7
5	1	2	5	8
6	1	2	6	10
7	1	3	7	12
8	2	3	8	14
9	2	4	9	16
10	2	4	10	17
11	2	4	11	19
12	3	5	12	21
13	3	5	13	23
14	3	6	14	24
15	3	6	15	26
16	4	7	16	28
17	4	7	17	30
18	4	8	18	32
19	4	8	19	33
20	5	8	20	35
21	5	9	21	37
22	5	9	22	39
23	5	10	23	40
24	6	10	24	42
25	6	11	25	44
26	6	11	26	46
27	6	12	27	48
28	7	12	28	49
29	7	12	29	51
30	7	13	30	53
31	7	13	31	55
32	8	14	32	56
33	8	14	33	58
34	8	15	34	60
35	8	15	35	62
36	9	16	36	64
37	9	16	37	65
38	9	16	38	67
39	9	17	39	69
40	10	17	40	71

Cross Index the ship's mass with the desired speed. The result is the required energy. Example: A ship with mass 4/3 wants to go 20. The energy required for this speed would be 35.

If you want the ship to back up, you may request a negative speed, although this will require half again as much energy. A ship may not begin its turn with a speed greater than 0 if it is to move backwards (i.e., a ship must stop before moving backwards). In this case the ship's stated course will be the direction the bow is pointing, not the true direction of travel. To enter a speed of zero press RETURN by itself. A ship travelling at speed zero has three times its normal turning rate.

NOTE: At any point you have the option to terminate the allocate Energy dialog by typing X and RETURN. Zero energy will be allocated to all remaining facilities except batteries, which will be automatically recharged if there is sufficient energy remaining. The program will automatically terminate the dialog when you have allocated all available energy.

How much ECM (0 to 6)?

Usually you will want to allocate as much energy as you can to Electronic Counter-Measures because energy spent here may disrupt enemy fire control systems, making drones miss your ship and enemy sensors fail to lock.

How much ECCM (0 to 6)?

Electronic Counter-Counter-Measures help you overcome enemy ECM and lock sensors in spite of his jamming.

Energy to transporters (0 to 3)?

Energy allocated to the transporter represents an attempt to beam Marine boarding parties to another ship (one boarding party per unit of energy). You can beam Marines between friendly ships at any time, but the transporter can penetrate enemy ships only when aimed directly through a fallen shield. Otherwise the attempt fails and the allocated energy is lost. (The Marines are not injured by unsuccessful beaming attempts.) If you allocate energy to the transporter you will be asked,

What ship is the target?

Type the initial of the target ship and press RETURN.

This concludes the Allocate Energy Dialog. At this point the program proceeds directly to the Maneuver and Fire Dialog.

4.3 MANEUVER AND FIRE DIALOG

When you are done allocating energy the program will, if necessary, ask you for some routine view screen parameters and then offer you this command menu:

What are your orders (MS = Move Ship, SD = Set Display, IS = Identify Ship, SC = Status Check, FW = Fire Weapons)?

The Set Display, Identify Ship and Status Check commands are the same as before (see above). This time, however, the Allocate Energy option is not available, but you can issue orders to Move Ships and Fire Weapons.

4.3.1 FW (Fire Weapons)

During each 30-second "turn" each of your ships may fire up to three aimed salvos using any combinations of weapons and targets (but a particular weapon may be fired only once per turn). *WARNING: The FW command may only be given once per ship.* When you enter the Fire Weapons command the program will ask:

Fire which torpedoes?

(For some ships the program asks about disruptors instead.) Specify the torpedoes you wish to fire in the first salvo by typing the number of each torpedo launcher, one after another, and press RETURN, like this:

1234<RETURN>

where "<RETURN>" means to push the RETURN button. Next, you will be asked:

Fire which phasers?

You may designate the phasers you wish to fire in the first salvo by typing in their numbers, just like the torpedoes, and pressing RETURN.

What ship is the target?

Type the initial of the first salvo's target ship, then press RETURN. (If there is only one enemy ship this question will not appear.)

Fire at (R)ange, (T)ime, or (L)ast Instant?

This is the point where you can make some very sophisticated decisions about your orders to your gun crews. Sometimes a battle can be won or lost right here. The options are:

(R)ange: The range option tells the individual weapon crews to fire as soon as the target is within the specified range. This command has two useful results.

If you are firing overcharged torpedoes you must shoot when the range is between two and eight Megaklicks or the torpedoes will have no effect. (If the range is less than two Mk the torpedoes will hit the target without exploding. At ranges over 8 Mk they run out of fuel.) Setting the firing range to 8 Mk as you move in toward the target guarantees that the torpedoes will fire at the right moment.



Figure 6: Firing at the "Last Instant" may mean:
A) Firing at the moment of closest approach.
B) Firing before the target leaves the area covered by your facing shield.



C) Firing just before your movement causes a different one of your shields to face the target.

The other use for the range command involves a trick for bringing your rear phasers into play. The range command puts the phaser crews on the alert, telling them to fire at the first moment that the target is within range and their weapons will bear on it. For instance, in an attack on an outpost you can instruct your phaser crews to fire at a range of 1 Mk and then maneuver your ship to pass directly over the outpost. When the ship comes within 1 Mk of the target all forward-facing phasers will fire. Then as you pass the outpost all rear-facing phasers will fire, too!

(T)ime: Each 30-second "turn" of the battle is broken down into sixteen arbitrary "time units." The time command lets you designate the exact moment to fire a salvo. This command lets you coordinate the fire of several ships to fire simultaneously into the same shield of the same target ship. It also lets you give orders to shoot *immediately* (time = 1) and possibly preempt the enemy's attack by damaging his ship before he can fire. If a weapon cannot fire at the indicated time due to its field of fire, the weapon will not fire during the turn.

(L)ast Instant: This command instructs a weapon crew to hold their fire until the last moment, which may mean one of three things (see Figure 6).

They will hold their fire as long as the target is getting closer, and then fire at the exact moment when the range begins to increase again (thus firing at the closest approach).

They will fire instantly if the target is moving in such a manner as to leave the area covered by your facing shield (where the "facing shield" is defined to be the shield which would be damaged if the enemy ship were to fire).

If none of the previous events occur during the turn, the crews will fire their weapons on the last moment of the turn.

When you have finished giving orders for the first salvo, the

program will ask you about the second salvo, and then the third. If you want to cut this short (firing less than three salvos this turn) just press the RETURN key twice.

If you are commanding a vessel equipped with drones, the last step of the Fire Weapons dialog will be the question:

Launch any drones (Y or N)?

If so, press the Y key and you will see:

What type of drone (1 or 2)?

Type 1 drones are fast, short-lived and carry a small warhead (about 10 damage units). Type 2 drones are slower, long-lived and much more powerful (about 20 damage units). Press 1 or 2 to launch the appropriate drone. (If you have only one type of drone available the program won't ask which kind to fire.) If the program asks you to identify the target ship type the ship's initial.

The last step for Reman ships involves firing the plasma torpedo. If the plasma torpedo launcher is fully energized, the Reman commander will be asked:

Do you wish to launch your Plasma Torpedo (Y or N)?

Press Y to fire, N or RETURN to abort the torpedo. Remember, though, that plasma torpedoes must be fired when they are ready or you lose them and have to spend another three turns recharging the launcher. If there is more than one enemy ship you will be asked to identify the target. Type the initial of the target ship.

4.3.2 MS (Move Ship)

The MS (Move Ship) command gives you control over alterations in the ship's course but not its speed. (Speed was set during the Allocate Energy dialog.)

When you give Move Ship commands, it is important to understand that the program breaks each turn down into sixteen "time points," each of them approximately equal to two seconds of combat time. The Move Ship dialog makes heavy use of these time points to express flight time between course changes.

When you give the Move Ship command you will see:

Time Pts.	Course	Speed	X coord	Y coord
16	4	10	-13	-15

What is your new course (0 to 360)?

This display tells you that there are 16 time units left in the turn and that the ship is moving on a bearing of 45° at 10 Mk/turn. It also gives you the absolute X and Y coordinates of the ship in the battlespace. To enter your next desired course, type it in and press the RETURN key.

NOTE: If you press RETURN without entering a new course your ship will continue on its old course.

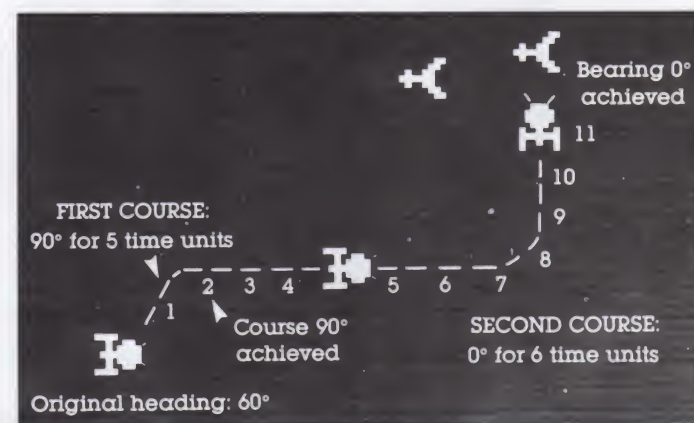


Figure 7: This Alliance cruiser needed two successive MS (move ship) commands to describe this S-curve. The first MS command turns the ship to bearing 90° for 5 time units. The second command alters course to 0° for six time units. At least one more MS commands would be required to complete the remaining 5 time units of the turn.

For how many time points (1 to 16)?

This question lets you set the duration of the ship's flight along the new bearing. You can enter up to sixteen course alterations per turn if you like (one time point each), or you can order the ship to maintain the new course for the whole turn by pressing RETURN (sixteen time units). Be sure to remember that the larger ships are not very maneuverable, and may take all 16 time units or even more to come around to your new heading.

Each time you have defined a new course and duration the program plots the resulting position of the ship on the display screen and then returns you to the command menu. You will have to give the MS order again to give another course and duration command. When you do, the display will show your *new* course, speed, location and remaining time resulting from your previous set of orders. This lets you enter several consecutive movement commands so you can see exactly where your ship is going and make midcourse corrections. See Figure 7 for an example.

WARNING!!! When you have given the movement orders for the sixteenth (final) time unit of the turn the command phase for this ship is *finished!* Be sure that you have given your Fire Weapons orders before finishing the movement orders!

When the orders phase for the current ship is over the program will automatically go on to your next ship, the enemy's ships, or to the execution phase.

4.4 FLEET ORDERS

During the orders phase of each turn a commander may designate certain of his ships as belonging to special "fleets," to which he will issue fleet orders. Each fleet consists of a designated flagship and one or more subordinate ships. The commander issues orders to the flagship as if for an individual ship, and then the program automatically re-issues the same orders to the remaining ships within that fleet. Fleet orders greatly speed up issuing orders to large numbers of ships.

In any turn a commander may elect to issue orders to individual ships, issue fleet orders to all ships (in one or more fleets), or he may assign some ships to fleets while issuing individual orders to the others.

At several points within the Command Phase you will be asked:

Do you wish to give Fleet Orders (Y or N)?

If not, type N or RETURN and issue orders to individual ships as described above. To issue fleet orders, type Y. The computer will then list all available ships, assigning a number between 0 and 9 to each ship. It will then ask:

Available ships:

- 0 Endeavor
- 1 Valiant
- 2 Terra Union
- 3 Intrepid

What ships do you wish in this fleet?

Type the number corresponding to the flagship, followed by the numbers of the subordinate ships and press RETURN. For example:

203<RETURN>

designates the Alliance dreadnought Terra Union (T) as the flagship of a fleet composed of the Endeavor (E) and the Intrepid (I).

Next the program will demand orders for the flagship (Terra Union), and will go through the standard Allocate Energy dialog and Maneuver and Fire dialog for that ship. On completion of the orders to the flagship, the program will automatically issue the same orders to the subordinate ships (Endeavor and Intrepid).

If there are other ships (not in this fleet) which still require orders, the program will give the player the opportunity to define another fleet or to issue individual orders to the remaining ships. A player might define as many as four fleets (of two ships each) if he has that many vessels at his command.

5.0 EXECUTION PHASE

When the orders for all craft have been given the program proceeds to the execution phase. During this phase the computer moves all ships and drones gradually and simultaneously along their ordered courses, firing all designated weapons at appropriate moments. The program prints messages announcing all significant activity as it occurs, determines the extent of damage to each ship as it is inflicted, and then automatically initiates the orders phase for the next turn.

6.0 EVALUATION OF THE BATTLE

When one side or the other has destroyed or captured all enemy ships the program will end the game and rate the victor on his skill. In determining this rating the program takes into account the relative strength of the opposing forces as well as the outcome of the battle. Therefore, a victory of six Klargon dreadnoughts over a single Freeman freighter does not reflect much credit on the Klargon commander, but if the freighter had won its commander would have been covered with laurels! In this context it is far more glorious to capture the enemy ships than to destroy them. This also makes it possible for a commander who is losing to deny the enemy the victory by turning his phasers on his own ships! Better death than dishonor!

For a complete description of victory conditions see the game selection card.

7.0 THE EPILOG

When the game has ended the program will offer you the option to examine the final status of the ships.

The status tables displayed during the Epilog of the game are not like the Status Check tables. The Epilog tables show the detailed internal breakdown of damage within each ship. The extent of damage is expressed in percentages where 0% means a device has been totally destroyed. Those entries shown as stars (*) instead of percentages are facilities which never did exist in this type of ship and therefore could not be damaged.

APPENDICES

A.0 PLAYTESTER'S NOTES ON STARSHIP TACTICS

The basic principles of good tactical deployment still hold true in space, but the nature of the offensive and defensive armament adds a few wrinkles which do not occur in combat on land, the sea, or even in the air. Here are a few observations from one starship commander with several successful campaigns behind him...

A.1 PRINCIPLES OF STARSHIP COMBAT

Starship battle is nearly all offensive. There is no territory

to defend and nowhere to run. Therefore most engagements tend to be aggressive fights to the finish in which one side or the other is totally eliminated. The only exception occurs when freighters try to outrun their tormenters, but that isn't really "combat."

The first principle of starship combat is to *concentrate your force* as much as possible. The ideal attack consists of maneuvering your fleet so that all of your ships can fire simultaneously at a single shield of a single enemy ship, usually the closest one. Such an attack can destroy the target ship at once, especially if the enemy commander expects the attack to hit somewhere else.

One especially dramatic example of this principle is the classic Klargon "drone swarm" attack on a Starbase, recently adopted by the Imperial forces for attacks on Freemen outposts (see Figure 8).

In this attack the assaulting ships rendezvous 29 Mk from the base. Once assembled they launch a swarm of Type 2 drones and fly directly toward the base at a speed of 10 Mk/turn using all available energy to reinforce their forward shields.

In the second turn they launch another round of Type 2 drones and continue toward the target at 10 Mk/turn. In turn three the Klargons launch a third round of drones, energize all weapons, and deliberately overfly the base to fire phasers and disruptors at minimum range. Performed with good fleet coordination this attack concentrates 27 drones, 54 disruptors and 45 phasers on the same defensive screen at the same moment ... an onslaught which not even a Starbase can withstand. (The attack results in about 1000 units of damage to a single shield!)

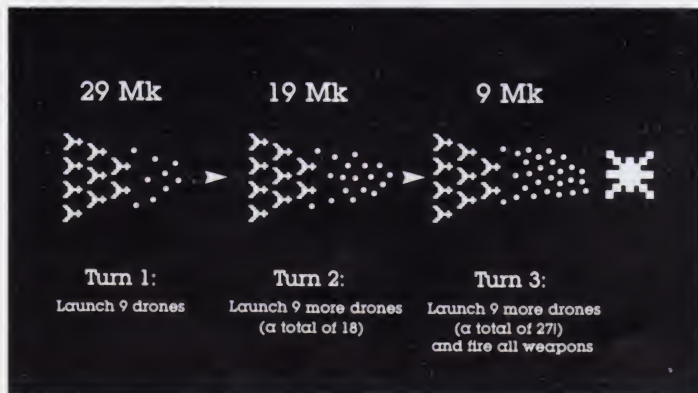


Figure 8: The Klargon drone-swarm attack on a starbase. Nothing can stand against it.

If you keep track of your hits on particular enemy shields it is possible to deliberately maneuver to hit the same shields on subsequent turns. It isn't easy, but the Identify Ship routine tells you the heading of the enemy ship, which in turn tells you the orientation of its shields. With a little attention to detail you can damage the same shield again and again until it falls.

The second principle of starship tactics, closely related to the first, is to *maximize your firepower*. This means to coordinate as many weapons as possible to fire in the shortest possible time at the shortest possible range. This is usually a little difficult due to the limited fields of fire of some starship weapons, not all of which will bear on the same target at the same time. Commanders quickly learn four tactical tricks which help them overcome this handicap:

- (1) **The J-curve attack.** Fly directly toward the target and fire all forward-facing weapons at once. Then turn sharply to one side and fire rear-facing weapons as they come to bear.
- (2) **The Fly-by attack.** Deliberately overfly the target's position, firing forward weapons during the approach and rear weapons during the departure.
- (3) **Carouselling.** Spin a motionless ship or base on its axis and fire all weapons as they come to bear.
- (4) **Threading the Needle.** To maximize your own firepower while minimizing the enemy's, suddenly fly your ships right through the center of his fleet! You will be able to shoot with all weapons at the targets surrounding you, but he will only be able to fire the weapons which can be brought to bear on the center of his own formation!

The third principle is to *minimize your own damage*. The "threading the needle" tactic does this by forcing the enemy ships to fire at you from all directions, denying them the opportunity to concentrate their fire on a single shield. This is a point where starship tactics differ sharply from classical experience. In space you are actually safest when in the center of the enemy formation because this denies him the ability to concentrate his firepower on individual screens!

The enemy commander doesn't know how badly damaged your ships are until they are destroyed entirely. If you have a

ship that can't shoot effectively but can still move, order it out to the point position to draw fire away from your other ships. Turn the ship's strongest remaining shields toward the enemy and reinforce them with all available energy. This makes the crippled ship even more resistant to damage than an intact ship, because the undamaged vessel cannot afford the luxury of devoting all energy to shields. A ship which can't shoot anymore can still donate its energy to the battle by attracting enemy fire this way.

Another way to limit your own damage is to execute a series of 90° course changes at illogical moments during each turn. This has the effect of spreading enemy fire over two or three of your shields where it might all have hit one shield otherwise.

A.2 TACTICS OF SPACE FIGHTER COMBAT

The tactics of fighting in very small spacecraft are a little different. Imperial and Freemen one-man fighters carry forward-shooting phasers and homing drones but little else. A fighter must fly directly toward a target in order to shoot at it with phasers, but the pilot must desperately avoid enemy drones. If the enemy launches a drone the only defense is to outrun it, but while you are running you can't shoot at the fighter! This produces dogfights where the object is to simultaneously outrun and dodge the enemy drones while trying to get the opposing fighter in your sights for a phaser shot. It is an intricate and deadly ballet.

One situation which develops in fighter engagements is a stern chase where an enemy fighter comes in on your tail with phasers blazing, but you can't turn and fight because there's a drone tracking you, too. Of course you can drop a drone with the enemy fighter's name on it, but if he is going fast enough the drone may miss him and be unable to catch up to him again. A better tactic is to cut your speed to zero, use the resulting surplus energy to fortify your rear shield, and blast him with your phasers as he overshoots you! The odds are that he didn't think to reinforce his rear shield ...

A.3 BOARDING ENEMY SHIPS

Boarding enemy ships can be a risky matter, but it's rewarding under the right circumstances. Starbases, capable of beaming 22 boarding parties per turn, can capture enemy ships with relatively little trouble. Remember that intraship combat greatly favors the defenders. The assaulting troops will need at least a three to one advantage in numbers in order to prevail over the defending Marines, and even then non-Marine crew members and automatic defense systems (booby traps) may prevent the boarders from seizing the ship.

A.4 COMMENTS ON FLEET ORDERS

There are drawbacks to fleet orders which require some experience with the ships to fully appreciate. Once you select a flagship you may only issue orders which are *appropriate to that ship*. The subordinate ships will then attempt to *exactly* mimic the behavior of the flagship. If the flagship is damaged, or is of a different design than the subordinate ships, the fleet orders issued from it may detract from the efficiency of the fleet as a whole.

As a worst case, consider a fleet composed of a Freeman freighter flagship and two Freeman fighters. The ships can maneuver together fairly well because the fighters can easily outperform the freighter. Wherever the freighter goes they can dutifully follow. Since all ships are armed with Type 1 drones, a fleet order from the freighter to fire drones at *one particular target* will result in three drones aimed at that target (never at different targets).

So far, so good. But if the freighter gives phaser orders the fleet is in trouble. The freighter's phasers #1 and #2 fire *aft*, while the fighters' phasers shoot *forward*. Fleet orders to fire phasers #1 and #2 at a designated target will result in some ships firing and others not (depending on the location of the target). Also, if the flagship's phasers were damaged, no phaser in the fleet would be able to fire!

Another place where you can get into trouble with fleet orders is by commanding the flagship to exceed the maximum speed of the subordinate vessels. In this case the flagship may

outrun the fleet! It is also possible for the fleet to outrun the flagship if you neglect to allow for differences in acceleration!

This means that you have to select your flagship carefully, and in some cases it is best to assign only identical ships to a fleet. Remember, *the orders issued to the flagship are followed blindly by the fleet.*

Fleet orders require care on the part of the commander. Here are a few suggestions to minimize your troubles:

Fleets of Alliance or Klargon Starships: Use undamaged dreadnoughts as flagships. They can easily command mixed fleets of cruisers and dreadnoughts if necessary. Don't put cruisers in command of fleets of dreadnoughts unless you want to hamper the dreadnoughts' firepower.

Reman Fleets: Keep the cruisers in separate fleets from the stodgy destroyers. Never mix them.

Starbases: Try not to mix starbases and outposts in the same fleets. Their fields of fire are too different to coordinate well. If you must, make the starbase the flagship. Never assign a starbase to a fleet with an outpost flagship.

Imperial Fleets: It's best not to mix fighters in fleets with raiders, but it can be done if you don't want to fire drones. Use the raider (1st class Imperial) as the flagship. If you use a fighter as a flagship in a fleet of raiders it may leave the raiders behind.

Freeman Fleets: Never, NEVER, try to mix fighters with freighters! Total pandemonium results due to the radically

different phaser fields of fire. Phasers that point forward don't coordinate well with phasers that point to the rear!

B.O. NOTES ON MULTI-PLAYER SCENARIOS

Although the program is not designed for multi-player scenarios, it is possible to misuse it slightly and incorporate as many as eight players all in competition against one another. (May the best pilot win!)

To do this run the two-player version of the program and give the "first player" up to eight identical ships, starbases or fighters. Then assign the "second player" exactly two ships. The players can each command one of "player one's" ships, which are quite capable of maneuvering independently and firing on one another! When it is time for the "second player" to give commands, just allocate zero energy for everything and order the ships to move in random directions. The result is a two-to-eight-way melee where it's every pilot for himself. The last ship left alive is the winner. This approach is especially useful for two-player duels where the pilots wish to fly exactly identical spacecraft.

For an unusual variation of this idea run the "Dogfight" scenario and let the computer command the two craft originally assigned to the "second player." Then while the human players are fighting it out for supremacy the computer will be moving in for the kill ...

CREDITS

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Starship Operation Manual: Bruce D. Clayton

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Printing: A&a Printers



You never thought your computer could be this exciting!



**465 Fairchild Drive, Suite 108
Mountain View, CA 94043**

REMAN LIGHT CRUISER "WAR EAGLE" (First Class)

Mass: 1.0

Turning Rate: 15°/time unit

Transporter Capacity: 1

Armament:

4 Heavy Phasers

1 Plasma Torpedo Tube

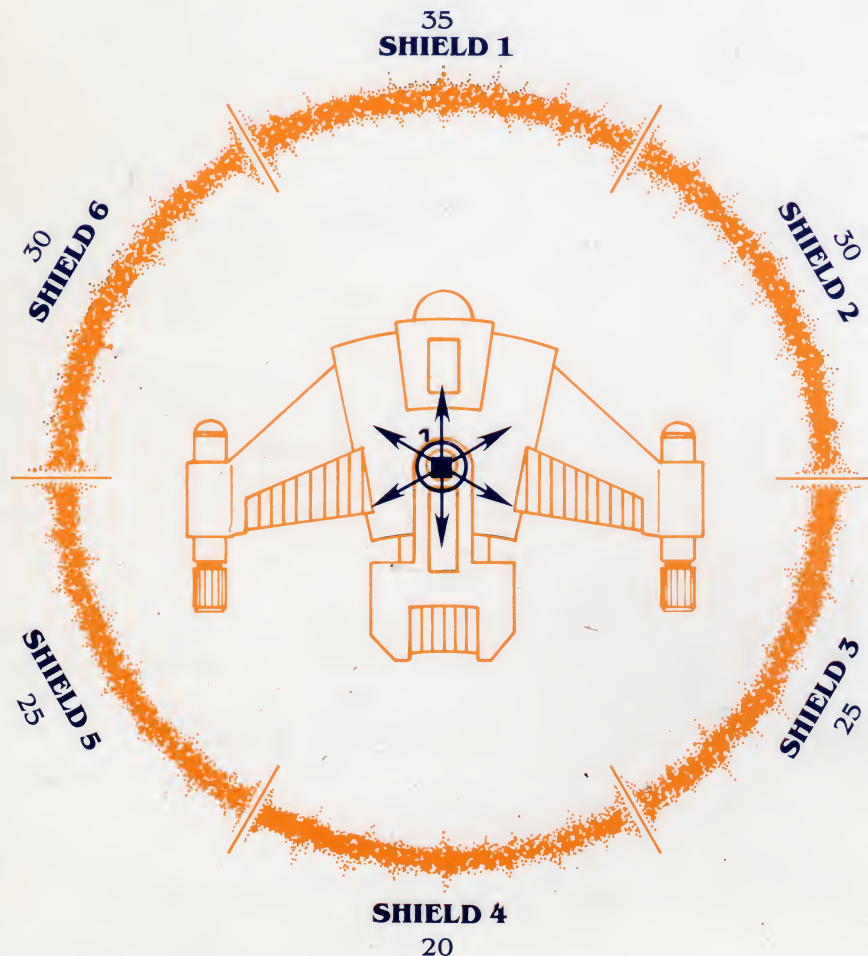
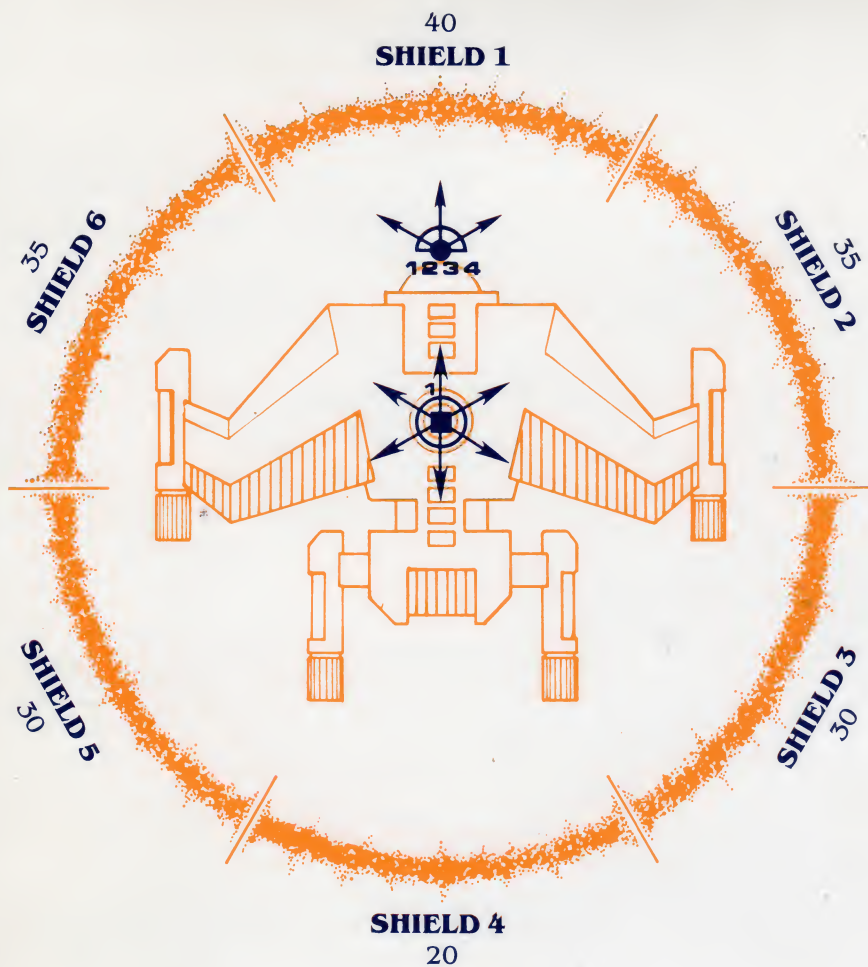
1 Cloaking Device

Power:

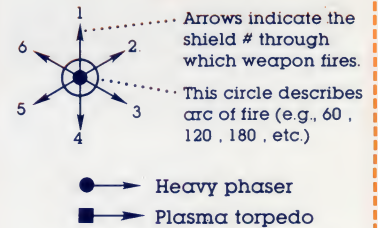
Engines: 26

Batteries: 6

5 Boarding Parties



THE WARP FACTOR™ STARSHIP DATA CARD KEY



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REMAN DESTROYER "WARBIRD" (Second Class)

Mass: 1.0

Turning Rate: 23°/time unit

Transporter Capacity: 1

Armament:

1 Plasma Torpedo Tube

1 Cloaking Device

Power:

Engines: 6

Batteries: 6

5 Boarding Parties

STARBASE (First Class)

Mass: 10.0

Turning Rate: 4°/time unit

Transporter Capacity: 22

Armament:

9 Siege Phasers

6 Photon Torpedo Tubes

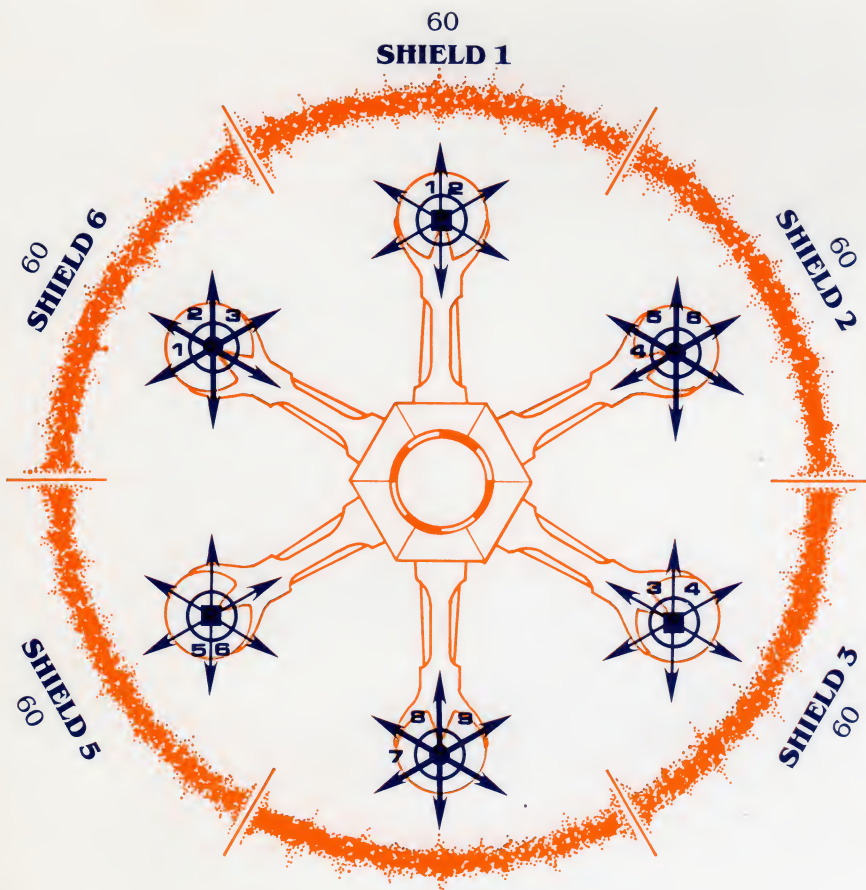
Power:

Engines: 76

Batteries: 44

50 Space Marine

Boarding Parties

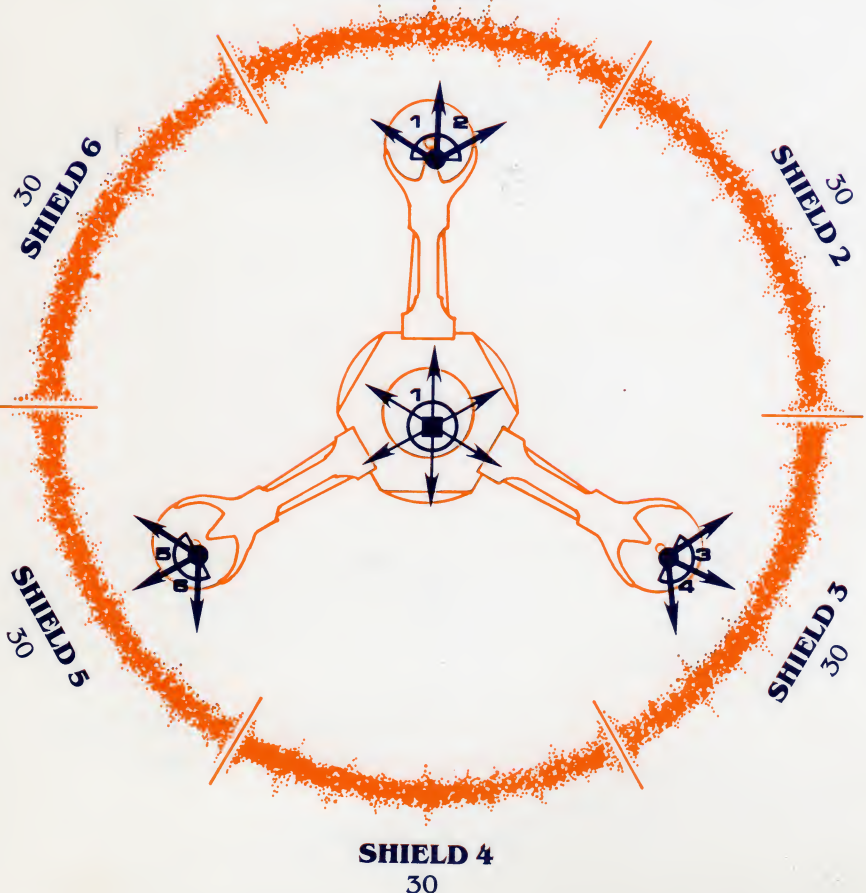


SHIELD 4

60

30

SHIELD 1



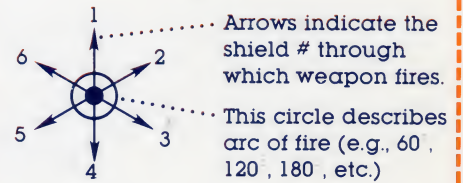
SHIELD 4

30

THE WARP FACTOR™

STARSHIP DATA CARD

KEY



● Siege phaser

■ Photon torpedo

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OUTPOST STARBASE (Second Class)

Mass: 3.0

Turning Rate: 4°/time unit

Transporter Capacity: 2

Armament:

6 Siege Phasers

1 Photon Torpedo Tube

Power:

Engines: 10

Batteries: 2

12 Space Marine

Boarding Parties

KLARGON DREADNOUGHT (First Class)

Mass: 1.33

Turning Rate: 15°/time unit

Transporter Capacity: 8

Armament:

1 Siege Phaser

4 Heavy Phasers

4 Light Phasers

6 Disruptor Bolts

12 Type 1 Drones

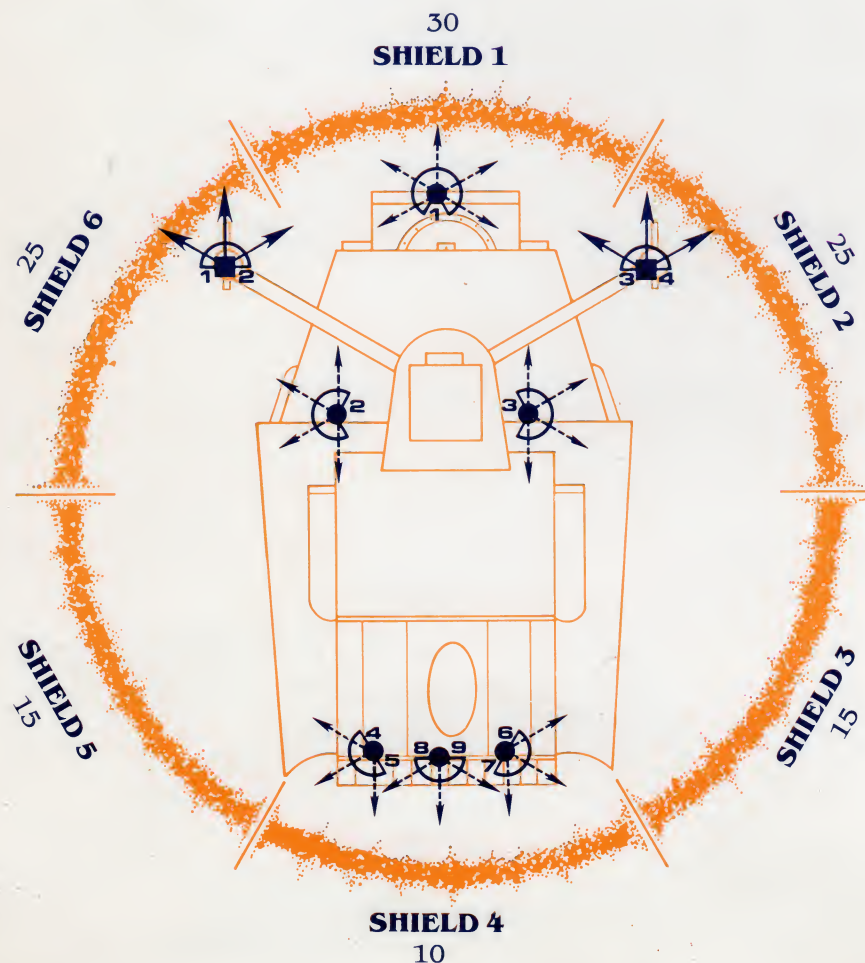
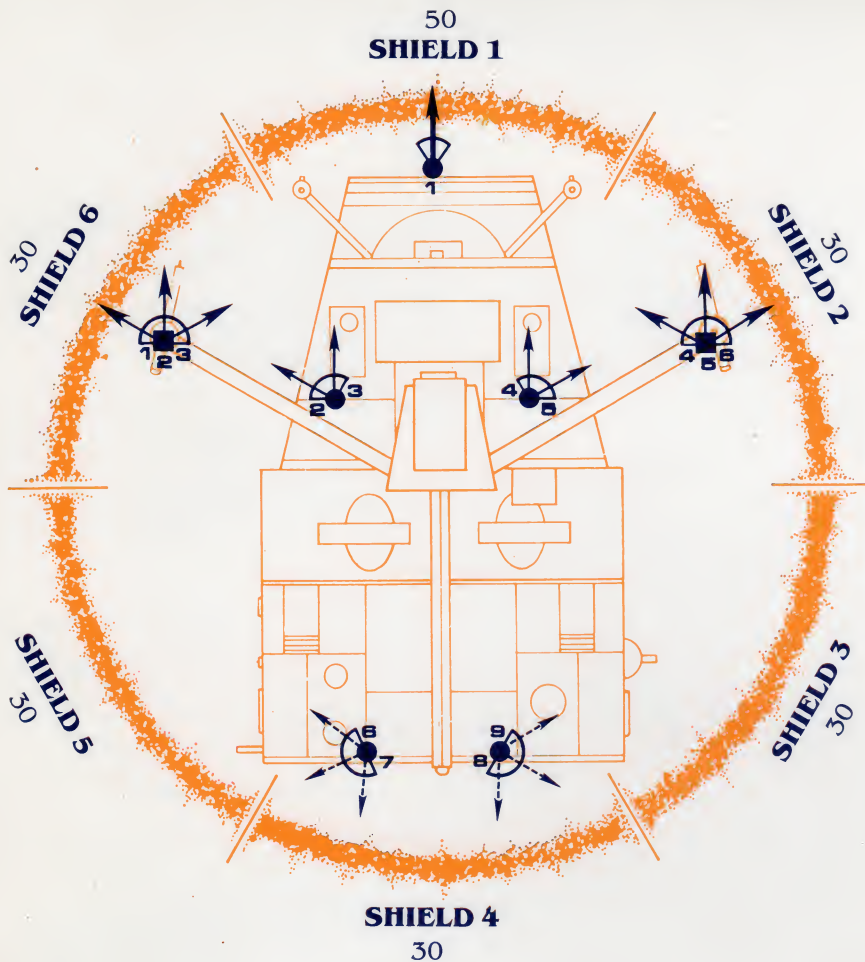
6 Type 2 Drones

Power:

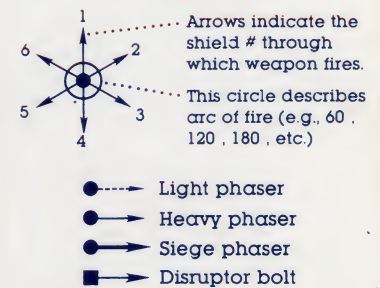
Engines: 57

Batteries: 8

24 Boarding Parties



THE WARP FACTOR™ STARSHIP DATA CARD KEY



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KLARGON CRUISER (Second Class)

Mass: 1.0

Turning Rate: 19°/time unit

Transporter Capacity: 5

Armament:

9 Light Phasers

4 Disruptor Bolts

4 Type 1 Drones

2 Type 2 Drones

Power:

Engines: 37

Batteries: 3

14 Boarding Parties

IMPERIAL RAIDER (First Class)

Mass: 0.67

Turning Rate: 30°/time unit

Transporter Capacity: 0

Armament:

2 Light Phasers

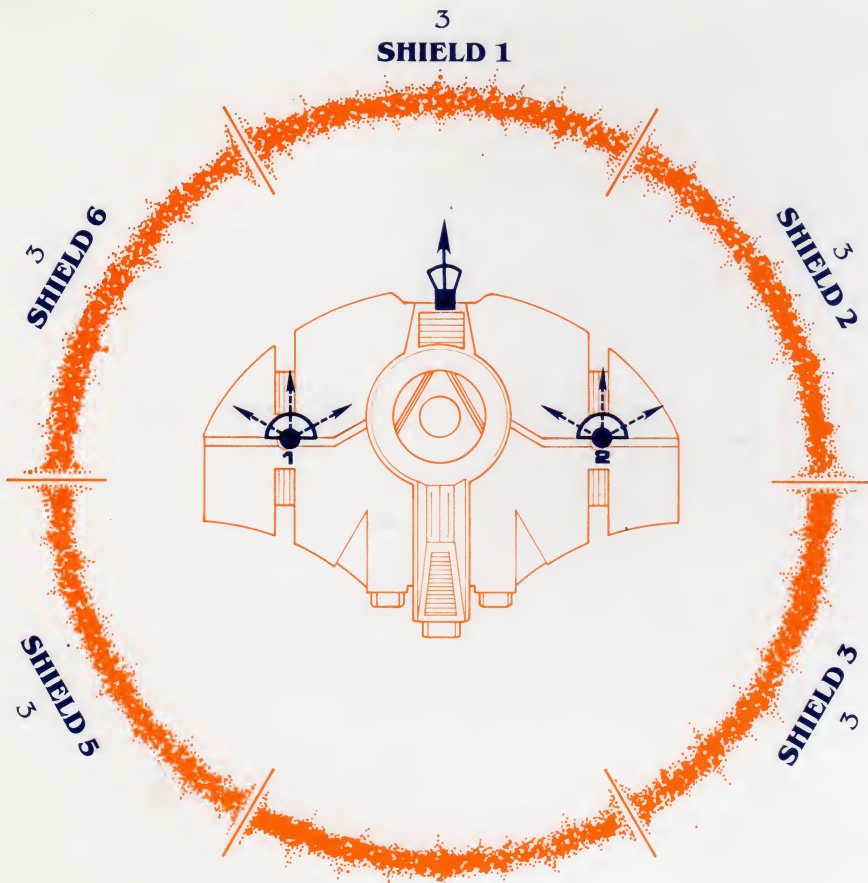
1 Disruptor Bolt

Power:

Engines: 10

Batteries: 5

0 Boarding Parties

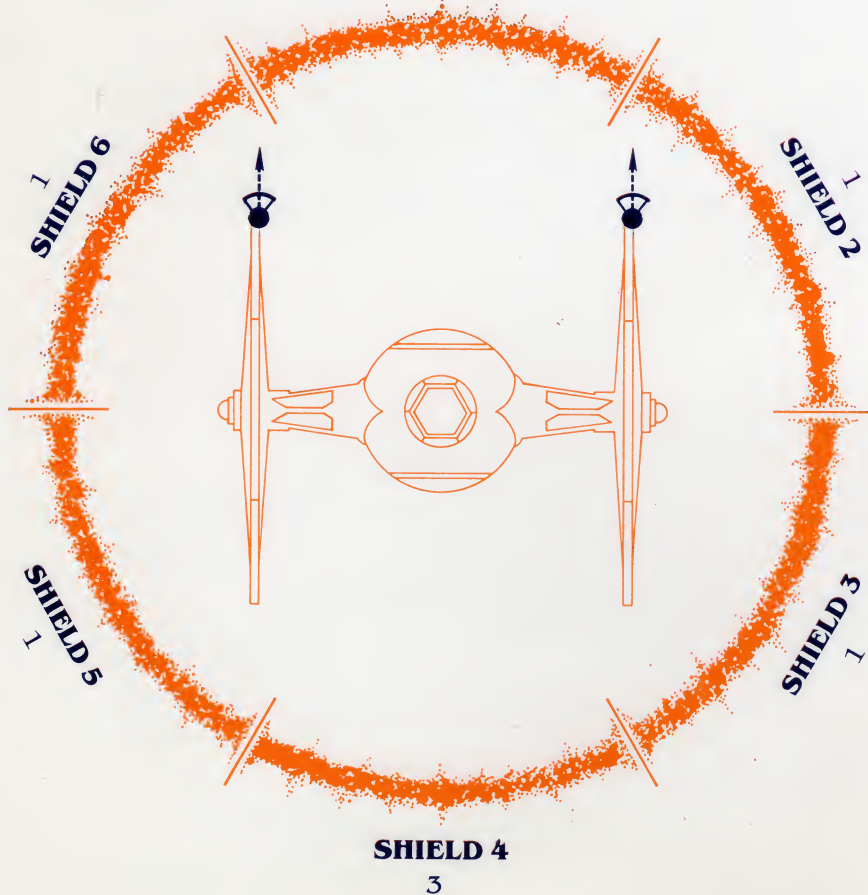


SHIELD 4

3

3

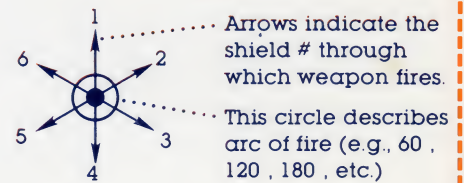
SHIELD 1



SHIELD 4

3

THE WARP FACTOR™ STARSHIP DATA CARD KEY



● → Light phaser

■ → Disruptor bolt

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IMPERIAL FIGHTER (Second Class)

Mass: 0.5

Turning Rate: 45°/time unit

Transporter Capacity: 0

Armament:

2 Light Phasers

2 Type 1 Drones

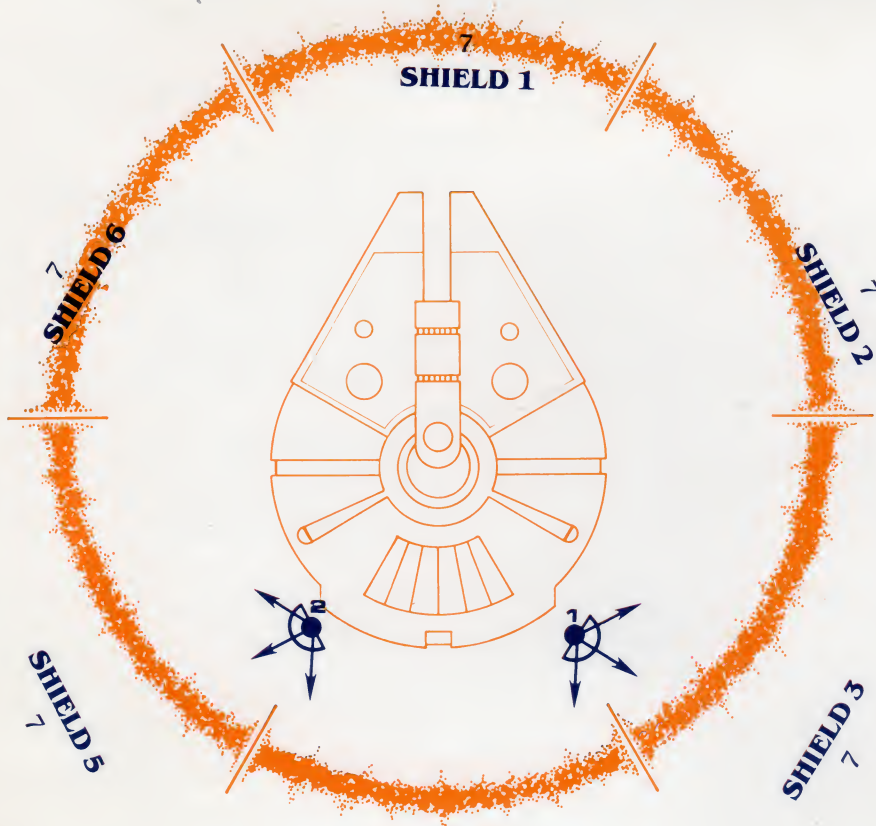
Power:

Engines: 8

Batteries: 2

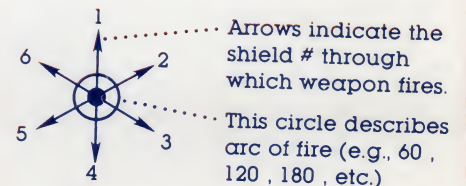
0 Boarding Parties

FREEMEN FREIGHTER (First Class)



Mass: 0.67
 Turning Rate: 22°/time unit
 Transporter Capacity: 0
 Armament:
 2 Heavy Phasers
 4 Type 1 Drones
 Power:
 Engines: 16
 Batteries: 4
 0 Boarding Parties

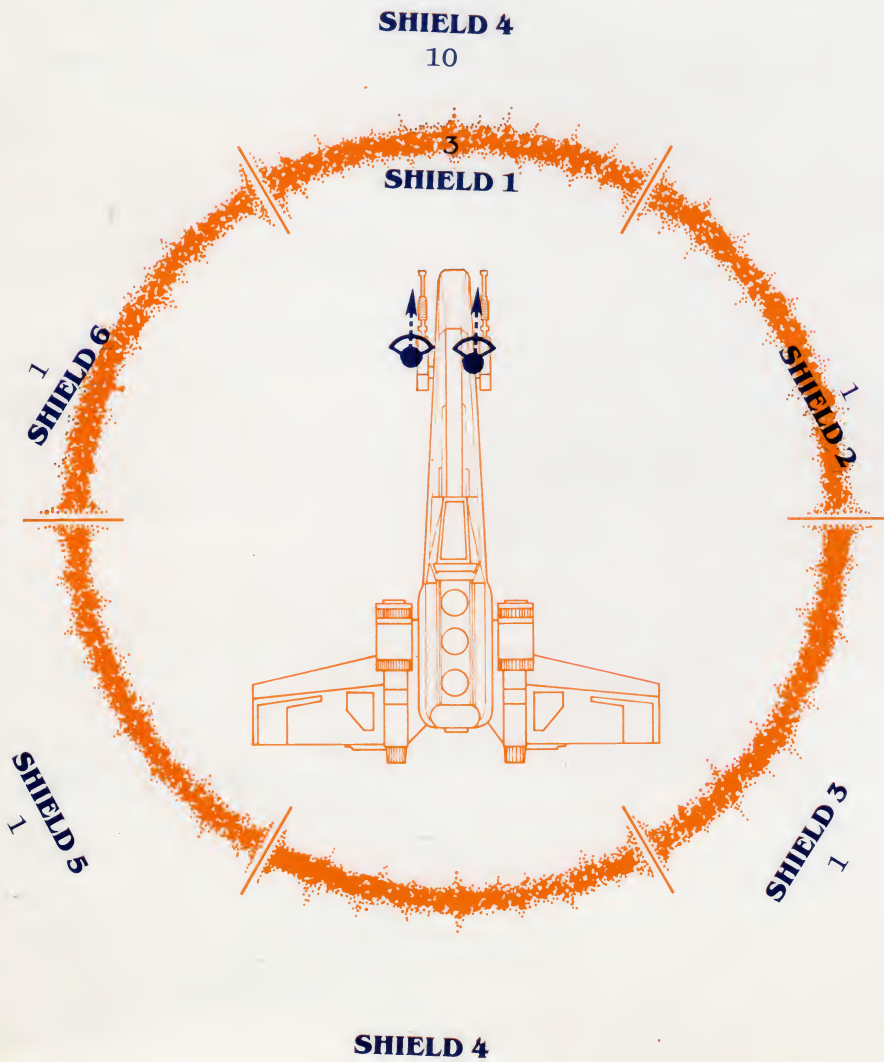
THE WARP FACTOR™ STARSHIP DATA CARD KEY



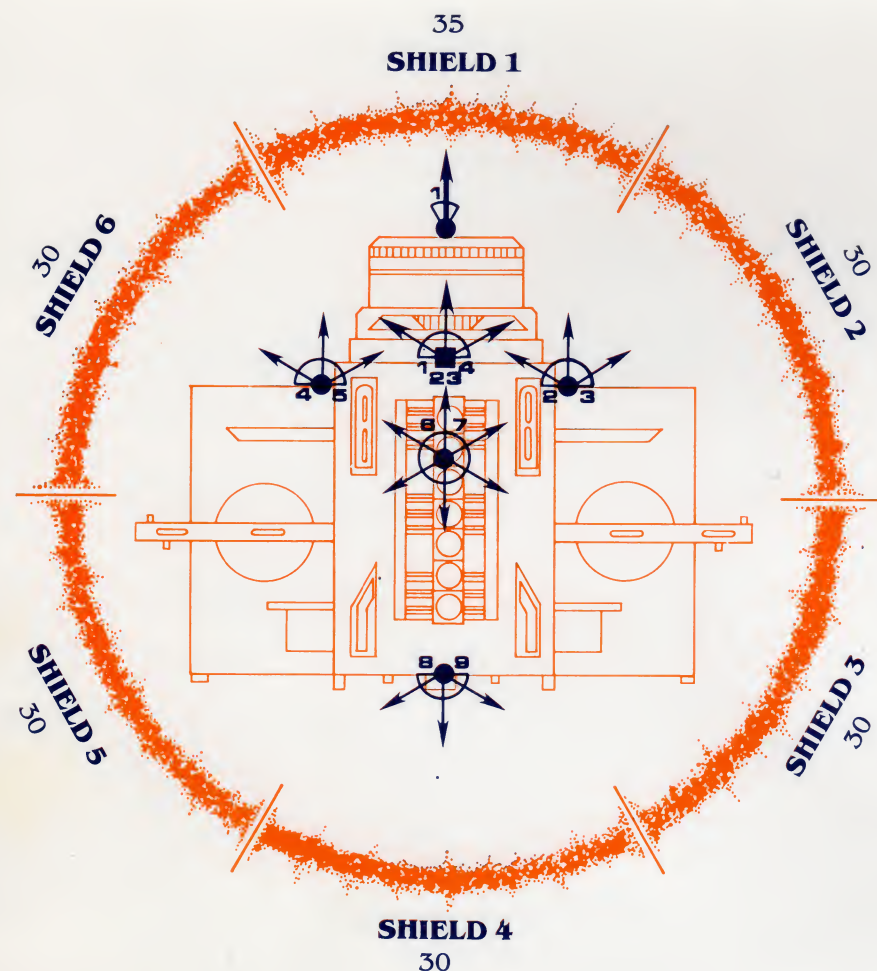
● → Light phaser
 ● → Heavy phaser

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FREEMEN FIGHTER (Second Class)



Mass: 0.5
 Turning Rate: 45°/time unit
 Transporter Capacity: 0
 Armament:
 2 Light Phasers
 2 Type 1 Drones
 Power:
 Engines: 8
 Batteries: 2



ALLIANCE DREADNOUGHT (First Class)

Mass: 1.33

Turning Rate: 11°/time unit

Transporter Capacity: 4

Armament:

1 Siege Phaser

8 Heavy Phasers

4 Photon Torpedo Tubes

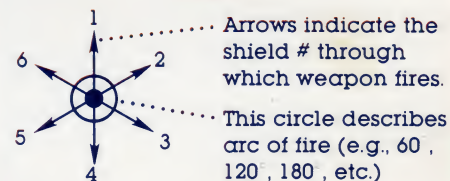
Power:

Engines: 53

Batteries: 5

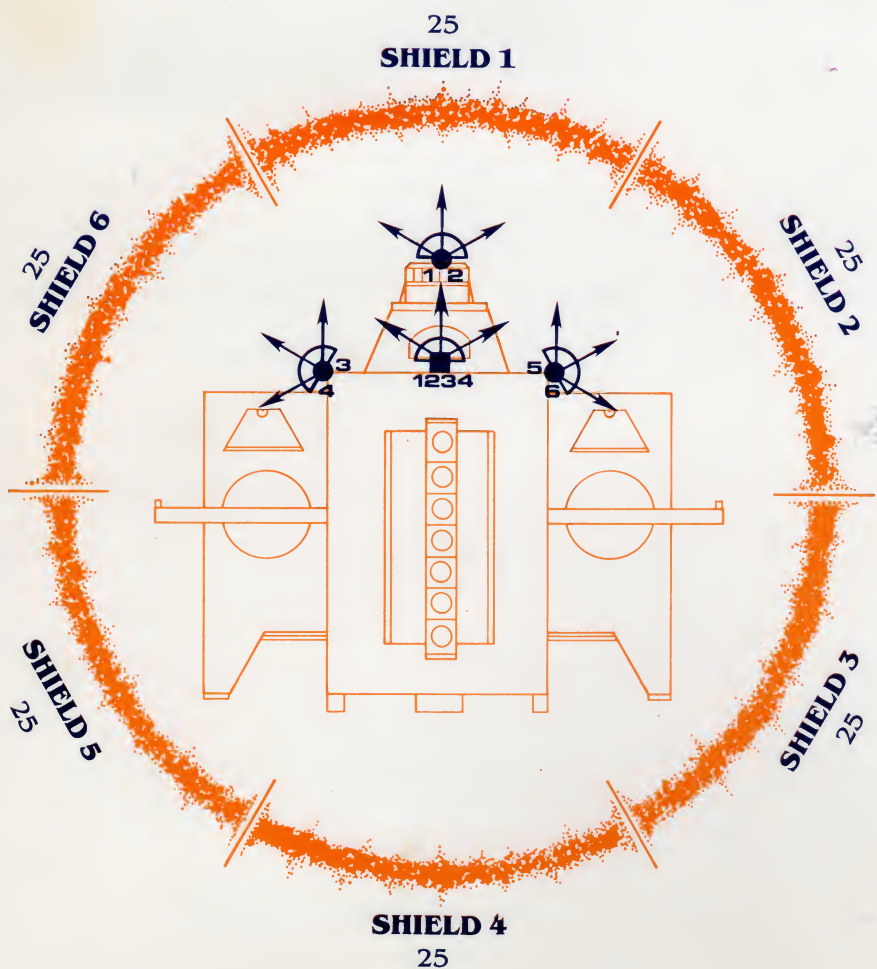
14 Boarding Parties

THE WARP FACTOR™ STARSHIP DATA CARD KEY



- Heavy phaser
- Siege phaser
- Photon torpedo

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ALLIANCE HEAVY CRUISER (Second Class)

Mass: 1.0

Turning Rate: 15°/time unit

Transporter Capacity: 3

Armament:

4 Photon Torpedo Tubes

6 Heavy Phasers

Power:

Engines: 34

Batteries: 4

10 Space Marine

Boarding Parties

THE WARP FACTOR™

GAME SELECTION CARD

There are five separate scenarios in THE WARP FACTOR. Four of the scenarios are set for solitaire play and they are Reman Chase, Attack on an Outpost, Attack on a Starbase, and Dogfight. The fifth scenario is totally free form with two players choosing their fleets and then fighting for control of space.

1. Reman Chase

This scenario pits a single Alliance heavy cruiser against a Reman destroyer. The player commands the Alliance ship whose mission it is to destroy the Reman ship before the computer can pilot it to the safety of the Alliance/Reman neutral zone. The player wins if he destroys the Reman ship. The computer wins if the Alliance ship is destroyed, even if the Reman ship has also been destroyed. The computer also wins if the Reman ship is able to cross the neutral zone, or if the Alliance ship upsets the current political stability by crossing the neutral zone. (Note: Due to a shortage of fuel, the Alliance cruiser's warp drives are operating at only $\frac{2}{3}$ efficiency. Thus the Alliance ship has 10 less points of energy to allocate each turn.)

2. Attack on an Outpost

This scenario allows the player to choose his ships (see Choosing Your Ships) while the computer is given one outpost. Your performance is evaluated by the computer in the manner described in the Victory Conditions section.

3. Attack on a Starbase

This scenario is similar to scenario 2, with the only difference being that the computer commands a starbase instead of an outpost (... and what a difference).

4. Dogfight

In this scenario the player chooses starships for both himself and the computer (see Choosing Your Ships). The computer will evaluate the winner as per the section on Victory Conditions.

5. Two-Player Dogfight

This is just scenario four with two human players fighting each other (don't worry, your computer is still acting as referee).

CHOOSING YOUR SHIPS

In scenarios 2-5 the player must choose his ships (and possibly the ships used by the computer). Each starship is assigned a point value that accounts for the relative strength of the ship. These values are given below:

STARSHIP	VALUE
Starbase	21
Alliance Dreadnought	9
Klargon Dreadnought	9
Reman Cruiser	9
Alliance Heavy Cruiser	6
Klargon Cruiser	6
Outpost	6
Reman Destroyer	5
Freeman Freighter	3
Imperial Raider	2
Freeman Fighter	1
Imperial Fighter	1

When choosing your ships, keep in mind that one side may choose ships whose total value is up to 20% higher than the total value of the other side's ships (actually you may give one side greater than a 20% advantage, but the victory point algorithm may not award a victory to the advantaged side even if all of the smaller side's ships are captured). Example 1: In scenario 4 a player could give the computer 2 Klargon dreadnoughts and 1 Klargon cruiser (i.e., $9+9+6=24$ points) while taking for himself a fleet consisting of 1 Alliance dreadnought and 2 Alliance cruisers (i.e., $9+6+6=21$ points). Although the player is at a 14% disadvantage in determining victory the computer will consider this, thus making the scenario acceptable. Example 2: In scenario 2 a player could choose ships that valued between 5 and 7 points since he is opposed by a 6-point outpost.

Note: Remember that each player may only have ships representing one Empire in any one scenario (i.e., there is no mixing of nationalities).

VICTORY CONDITIONS

In determining the victor of a game, the computer evaluates the players' performance by considering the amount of damage inflicted upon the enemy, the amount of damage received, and the beginning strengths of the opposing forces. After a game has been ended, the computer will tell the player(s) which side has performed the best, and then display a numerical rating of the game's outcome. The players should refer to the following chart to determine the level of the victory:

Decisive Victory	4.0+
Substantive Victory	2.01 to 3.99
Marginal Victory	1.25 to 1.99
Draw	1.00 to 1.24

In determining victory, a captured ship is worth $2 \times$ (ship's point value), a destroyed ship is worth $1 \times$ (ship's point value), and a damaged ship is worth $.5 \times$ (ship's point value) \times ((% of general damage done to the ship) $\times .01$). Also, the side which decides to end the game (withdrawal) forfeits $\frac{1}{2}$ of the total point value of all of his surviving ships (but does not lose points for damage on these surviving ships). When a game is ended the computer will ask the players to input which player decided to withdraw. If both players decide to withdraw neither player is penalized. The victory formula used by the computer also accounts for the start of game strengths of the two sides (i.e., the weaker side receives a handicap). Example 1: One Alliance cruiser destroys one Klargon cruiser while sustaining 60% general damage. The result would be an Alliance marginal victory with a value of 1.62. Example 2: An Alliance dreadnought and an Alliance cruiser battle two Klargon dreadnoughts, with one Alliance dreadnought being captured, one Klargon dreadnought being destroyed and the Alliance cruiser withdrawing after receiving 30% general damage. The result would be a Klargon marginal victory with a value of 1.29. If the Alliance dreadnought had been destroyed instead of captured the result would be a draw with the Alliance player rated slightly ahead with a value of 1.19.

ENERGY DIAGRAM

SPEED	MASS			
	1/2	2/3	1	4/3
0	0	0	0	0
1	0	0	1	1
2	0	0	2	3
3	0	1	3	5
4	1	1	4	7
5	1	2	5	8
6	1	2	6	10
7	1	3	7	12
8	2	3	8	14
9	2	4	9	16
10	2	4	10	17
11	2	4	11	19
12	3	5	12	21
13	3	5	13	23
14	3	6	14	24
15	3	6	15	26
16	4	7	16	28
17	4	7	17	30
18	4	8	18	32
19	4	8	19	33
20	5	8	20	35
21	5	9	21	37
22	5	9	22	39
23	5	10	23	40
24	6	10	24	42
25	6	11	25	44
26	6	11	26	46
27	6	12	27	48
28	7	12	28	49
29	7	12	29	51
30	7	13	30	53
31	7	13	31	55
32	8	14	32	56
33	8	14	33	58
34	8	15	34	60
35	8	15	35	62
36	9	16	36	64
37	9	16	37	65
38	9	16	38	67
39	9	17	39	69
40	10	17	40	71

Cross index the ship's mass with the desired speed. The result is the required energy. Example: A ship with mass 4/3 wants to go 20. The energy required for this speed would be 35.

ERRATA

4.2 Addition:

The target of a transporter attack may not be a second class Imperial or Freeman ship.

4.3.1 Clarification:

A drone may pass its target before exploding, thus hitting a non-facing shield.

5.7 Addition:

When a ship is captured, neither commander may give orders to it. The marines have just enough training to put all of the captured ship's energy into shield support. Thus, for either player to beam additional marines aboard the ship, the shield support must first be eliminated.